Chemical Week

December 1, 1956

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Florida natural gas pipeline? At least nine process firms are already lining up for supplies . . . . p. 21

New job-charting system soft-pedals who's who, concentrates on who does what . . . . . p. 30

Marketing Consultant Dale: He's alarmed by glowing sales forecasts, resultant overexpansion . . p. 44

Network of pollution monitors rings still abuilding fertilizer plant. Aim: foolproof protection . . p. 60

Research Director Scudi: He's willing to pay for researchers—but only for good ones . . . p. 87

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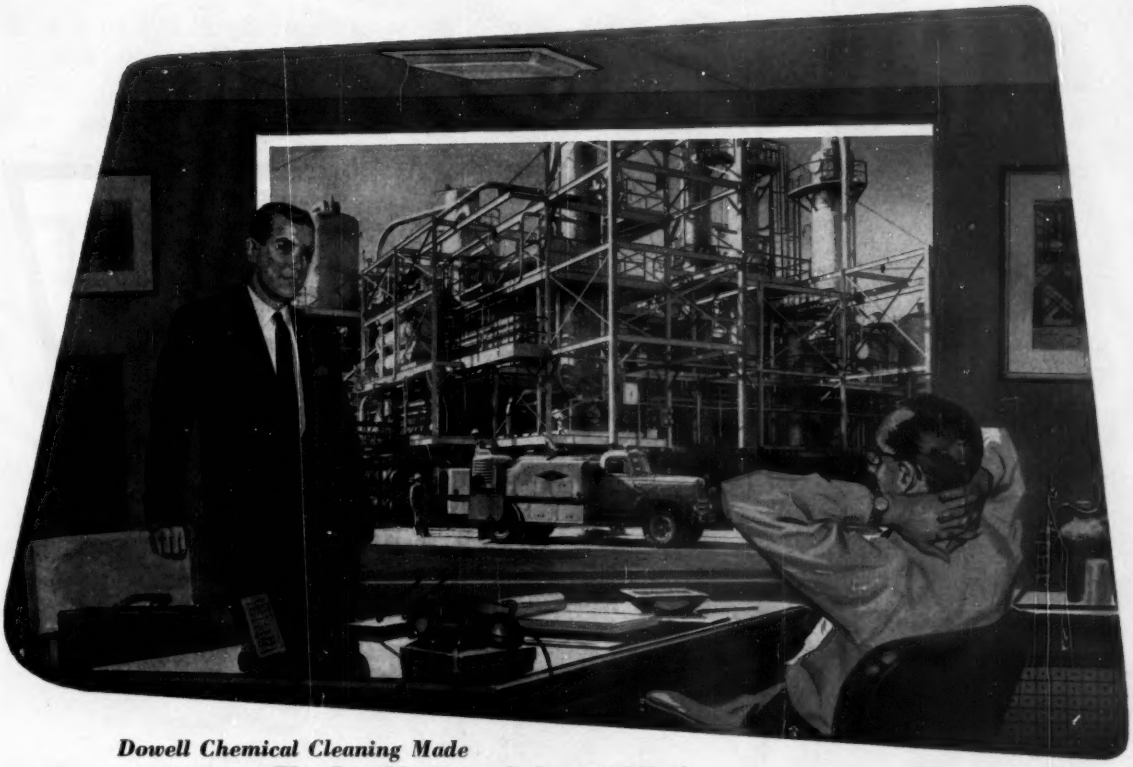

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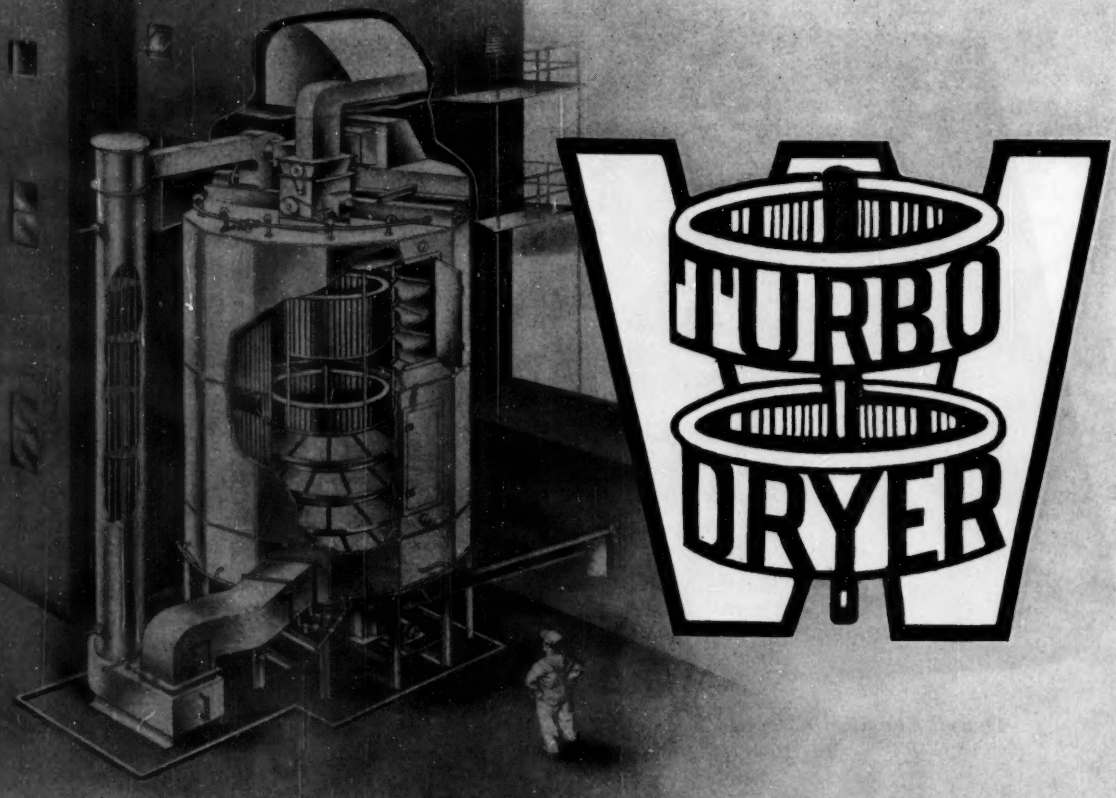

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Chemical Week

TOP OF THE WEEK

December 1, 1956

MCA and SPI have come to terms. They'll both push a new code for plastics in building .....p. 22

New push in water pollution abatement—here's what's happening around the country .....p. 24

Cheaper insurance for users of fire-retardant chemicals. That's what producers are campaigning for in an effort to boost sales .....p. 78

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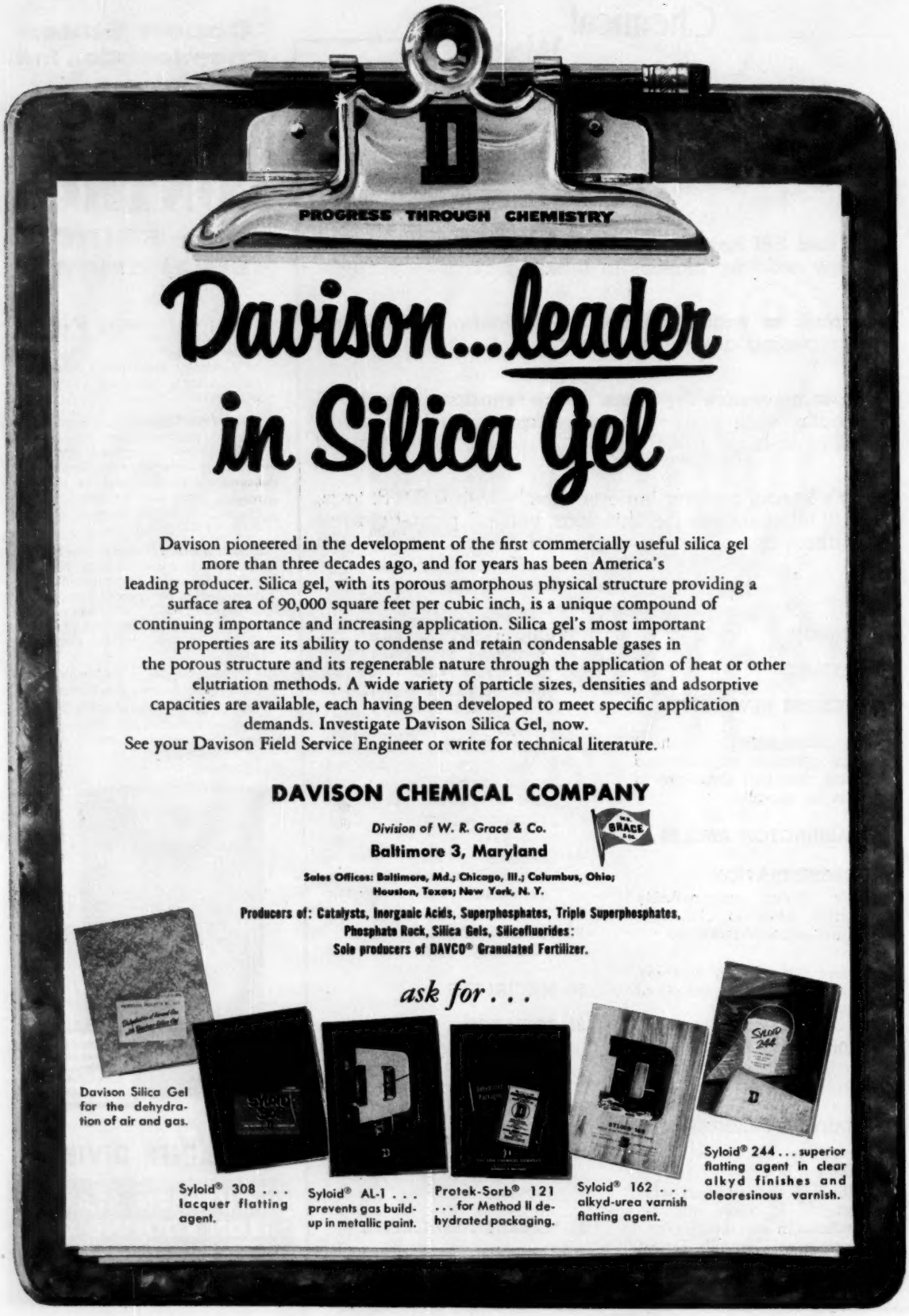

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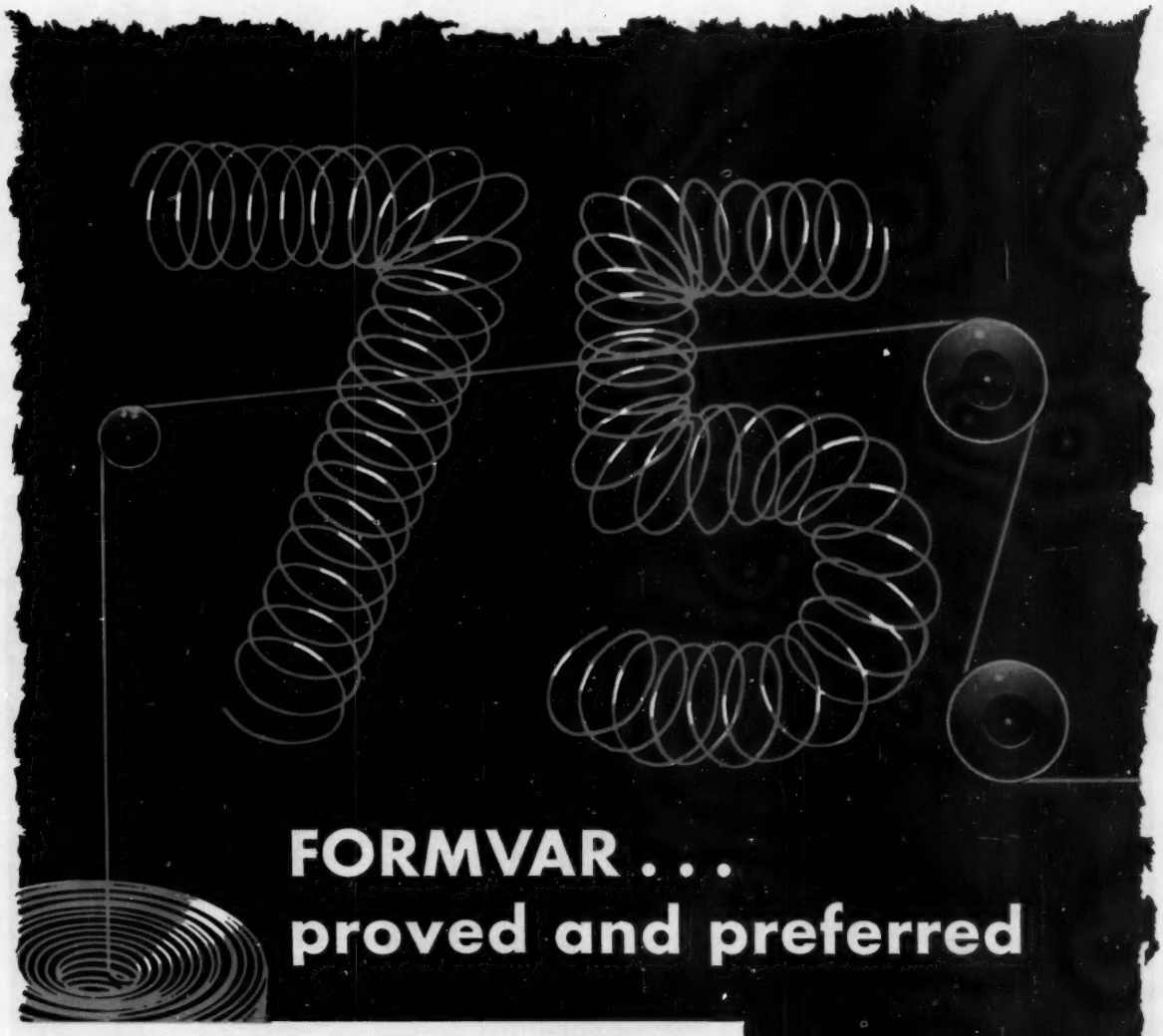

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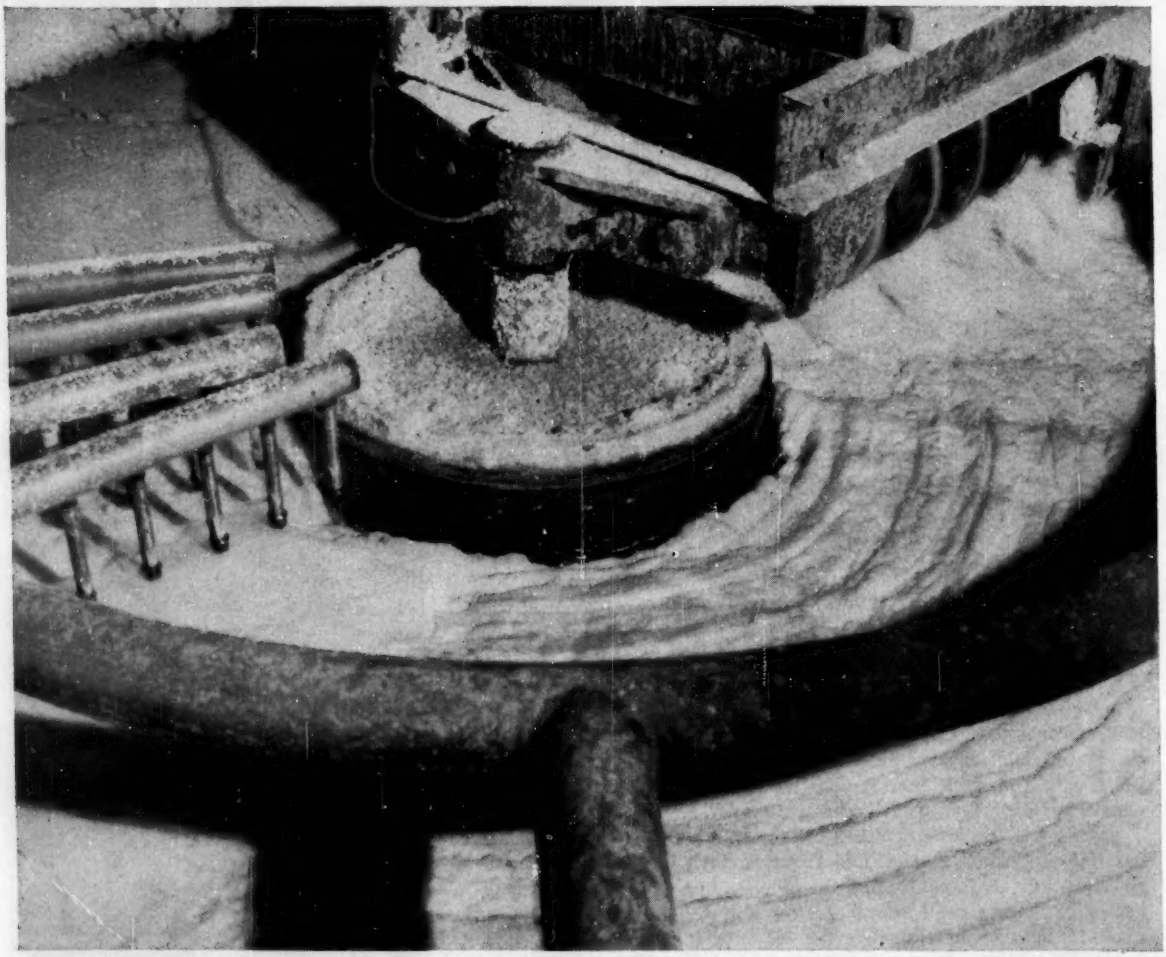

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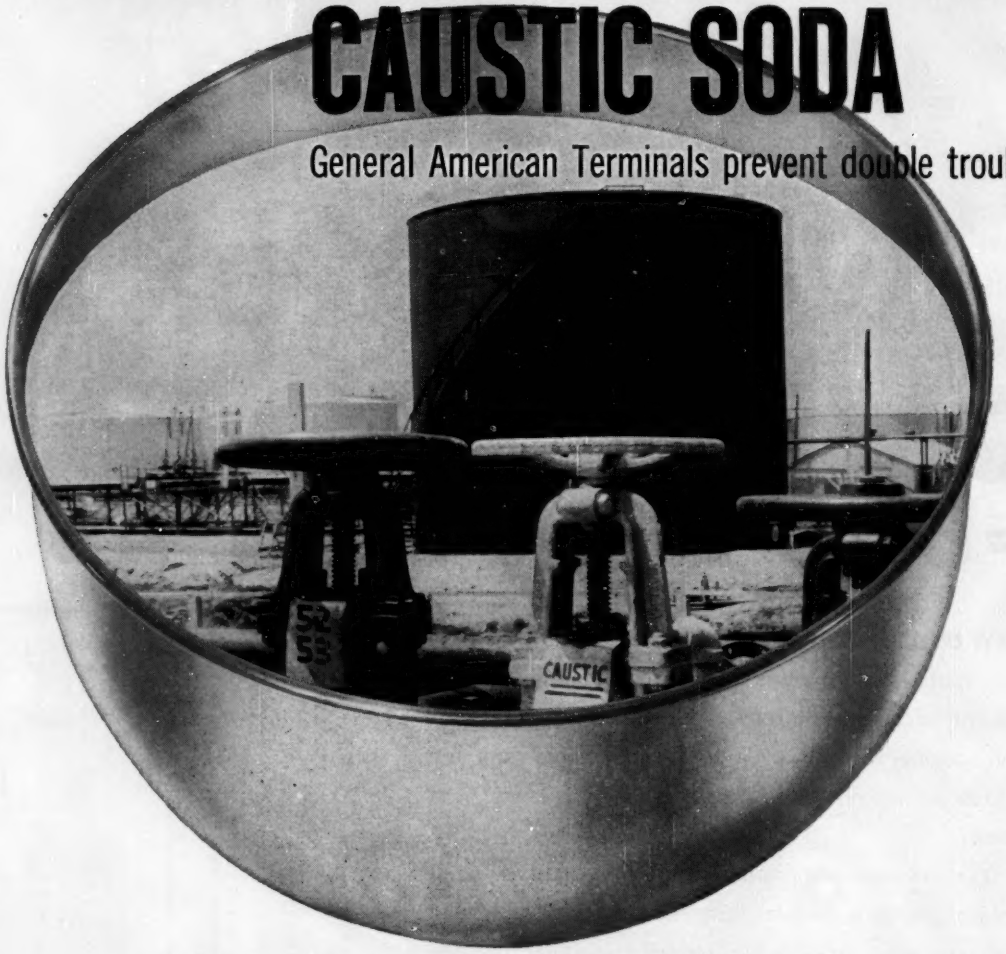

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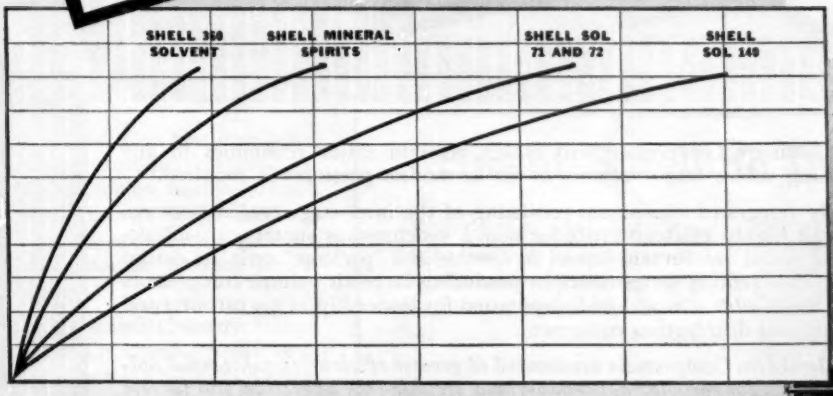

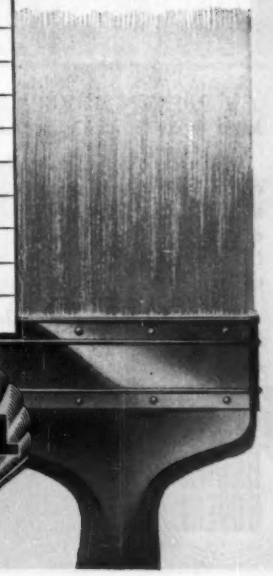

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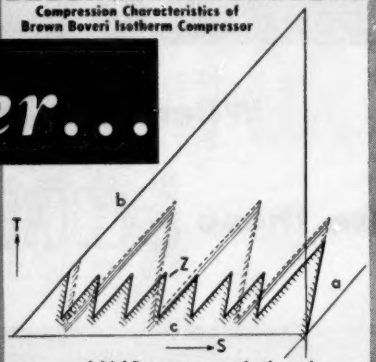

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b—Delivery pressure
c—Isothermal
S—Entropy
T—Absolute temperature

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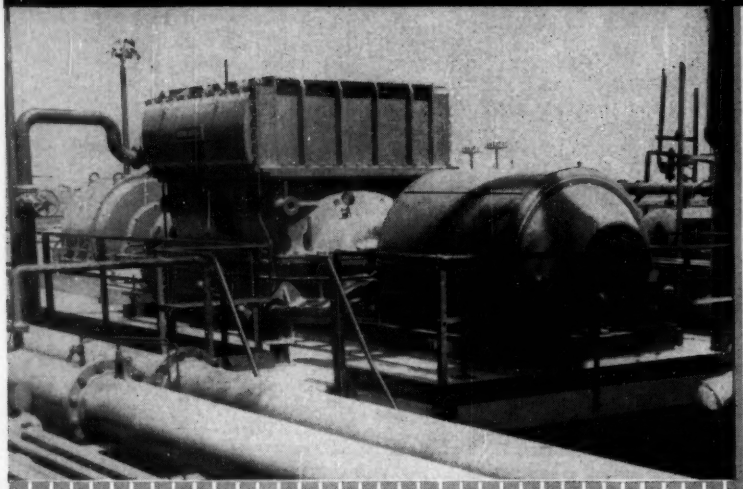

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Sodium Benzoate: Rust fighter for water-base products

It's easy to overlook the obvious. But not for long. Consequently, packagers of water-base paints, household detergents, adhesives, and various aerosols now find themselves blinking over the low cost and effectiveness of this obvious sleeper in the woodpile of corrosion inhibitors.

While aerosol fillers beat their breast over container-corrosion problems (CW, June 16, '56), sodium benzoate—which is non-toxic enough to be added to pickles and sauerkraut as a preservative—rests peacefully on their laboratory shelves.

Not so in the metals industry. Makers of steel products simply dip their shiny finished products in a 5% water solution of sodium benzoate and create a protective anodic film on the metal. The products don't rust even when stored under highly humid conditions.

While stainless steel has eliminated the danger of rust on most surgical instruments immersed in disinfectants—the packagers of the disinfectants who add 1.5% of sodium benzoate can boast a NON-RUSTING sterilant they can package in metal.

Although PVA and other water-base paints have largely solved container corrosion with can linings, "pin holes" or scrapes from mixing often play havoc with the product after long storage or when shelved after partial use. As little as 1% sodium benzoate in the product insures against container corrosion AND adds an extra merchandising benefit: Paint film containing benzoate applied over nails, fasteners, and metal stripping helps control rusting that bleeds through vapor-permeable coatings.

Manufacturers of antifreezes, too, are taking a new look at sodium benzoate because it protects against the corrosion promotion of dissimilar metals in contact in water. As little as 1.5% sodium benzoate plus 0.1% sodium nitrite inhibits both alcohol and ethylene glycol antifreezes.

So powerfully does sodium benzoate vaccinate against corrosion that 2-5% in wrapping paper (plain or waxed) is enough to protect needles, razor blades, mild steel strip, tools, instruments, and machine parts. Such wrappings eliminate the need for oiling or greasing because a bright steel fan shaft, for example, will stay rust-free in the wrappings even when stored in a damp cellar for 13 weeks.

Two booklets on the subject are available: "Sodium Benzoate as a Corrosion Inhibitor" and "Sodium Benzoate . . . Corrosion Inhibitor for Water-Base Paints." For copies, write: MONSANTO CHEMICAL COMPANY, Dept. CS-4, Organic Chemicals Division, St. Louis 1, Missouri.

Sweet-Smelling Incinerator

By copying a swank desert resort that had to burn its refuse aromatically, specialty marketers are making profits out of backyard incinerators. They simply repackage Monsanto Santomask II (a long-established odor-masking agent) in 1-lb and 5-lb. cans. The home owner sprinkles the liquid product liberally on a wad of newspaper and tosses the paper *on top* of the backyard trash burner. Instead of filling the yard with the smell of charred refuse, the incinerator gives out a pleasant aroma.

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OPINION

'Chemical,' Not 'Solvents'

TO THE EDITOR: Your feature article on pesticides (*Oct. 27*) is excellent and you should be commended for this enlightening report on this important subject.

Mr. Fischer, however, overlooked listing the Commercial Chemical Co., P. O. Box 86, Memphis 1, Tenn., among the leading pesticide producers, and under the product calcium arsenate.

We believe ourselves to be the largest manufacturers of calcium arsenate in the United States, our Delta brand being well known wherever this product is used.

HALLAM BOYD
President
Commercial Chemical Co.
Memphis, Tenn.

"Commercial Chemical" unaccountably became "Commercial Solvents" during the preparation of the report. We apologize to Reader Boyd.—ED.

Pesticide Plaudits

TO THE EDITOR: I want to congratulate you on the excellent [pesticides] article. . . .

This is the most complete report I have ever seen and will be exceedingly helpful to us in planning our future business.

A. H. CARTER
General Manager
Green Cross Products Division
Sherwin-Williams Co. of Canada, Ltd.
Montreal, Can.

TO THE EDITOR: All of us want to congratulate you on your very fine article. . . . We have not yet "digested" all of it, but can readily see it is going to be a very fine reference book for us and hundreds of others.

W. NEWTON LONG
Chairman of the Board
Miller Chemical & Fertilizer Corp.
Baltimore, Md.

Add Millmaster

TO THE EDITOR: We have read your article on pesticides in the (*Nov. 3*) issue with interest. . . . We have been manufacturers of naphthalene acetic acid and other growth regulators for many, many years; yet, no mention of us as a producer appears in the article. . . . We are listed in your BUYERS' GUIDE as suppliers of all of the following products, which we believe come under the general heading of growth regulators: α-naphthaleneacetamide, α-naphthaleneacetic acid, sodium α-naphthaleneacetate, methyl α-naphthaleneacetate, β-naphthoxyacetic acid, sodium β-naphthoxyacetate, and 2-4-5-trichlorophenoxypropionic acid.

. . . We have furnished the bulk of the requirements of many . . . firms in the agricultural field that market their own products containing these components. . . .

JEROME F. MCGINTY
Millmaster Chemical Corp.
New York

MEETINGS

Synthetic Organic Chemical Manufacturers Assn., annual meeting and dinner, Biltmore Hotel, New York, Dec. 3.

Chemical Specialties Manufacturers Assn., 43rd annual meeting, Mayflower Hotel, Washington, Dec. 3-5.

Air Pollution Control Assn., semiannual meeting, Rice Hotel, Houston, Dec. 3-5.

Society of the Plastics Industry, Inc., 7th film, sheeting and coated fabrics division conference, Commodore Hotel, New York, Dec. 4-5.

American Institute of Chemical Engineers, annual meeting, Statler Hotel, Washington, Dec. 10-12.

American Pharmaceutical Manufacturers' Assn., midyear and eastern section meeting, Waldorf-Astoria Hotel, New York, Dec. 10-12.

American Nuclear Society, winter meeting, Sheraton-Park Hotel, Washington, Dec. 10-12.

American Assn. for the Advancement of Science, 123rd meeting, Statler Hotel, New York, Dec. 26-31.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

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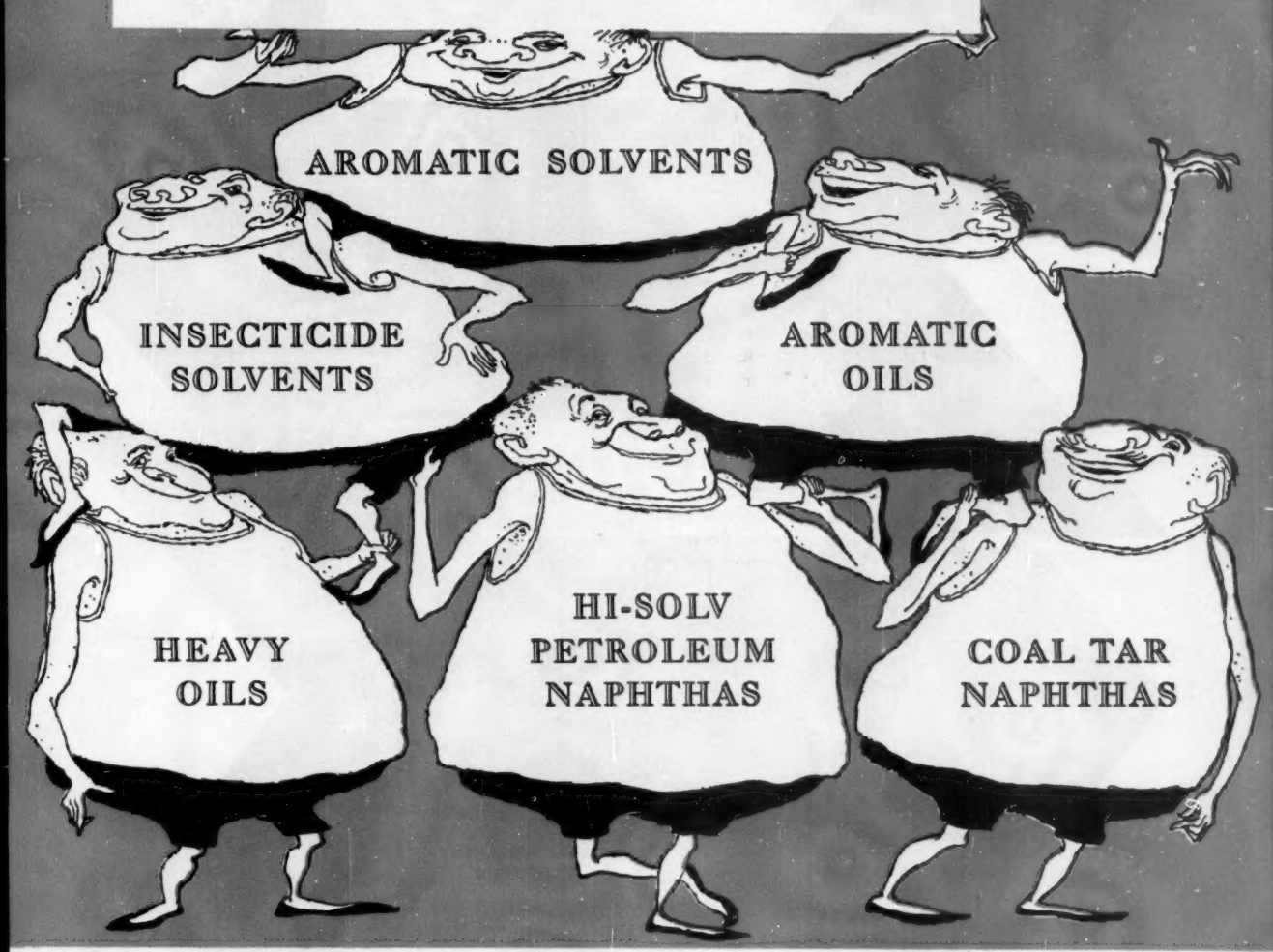

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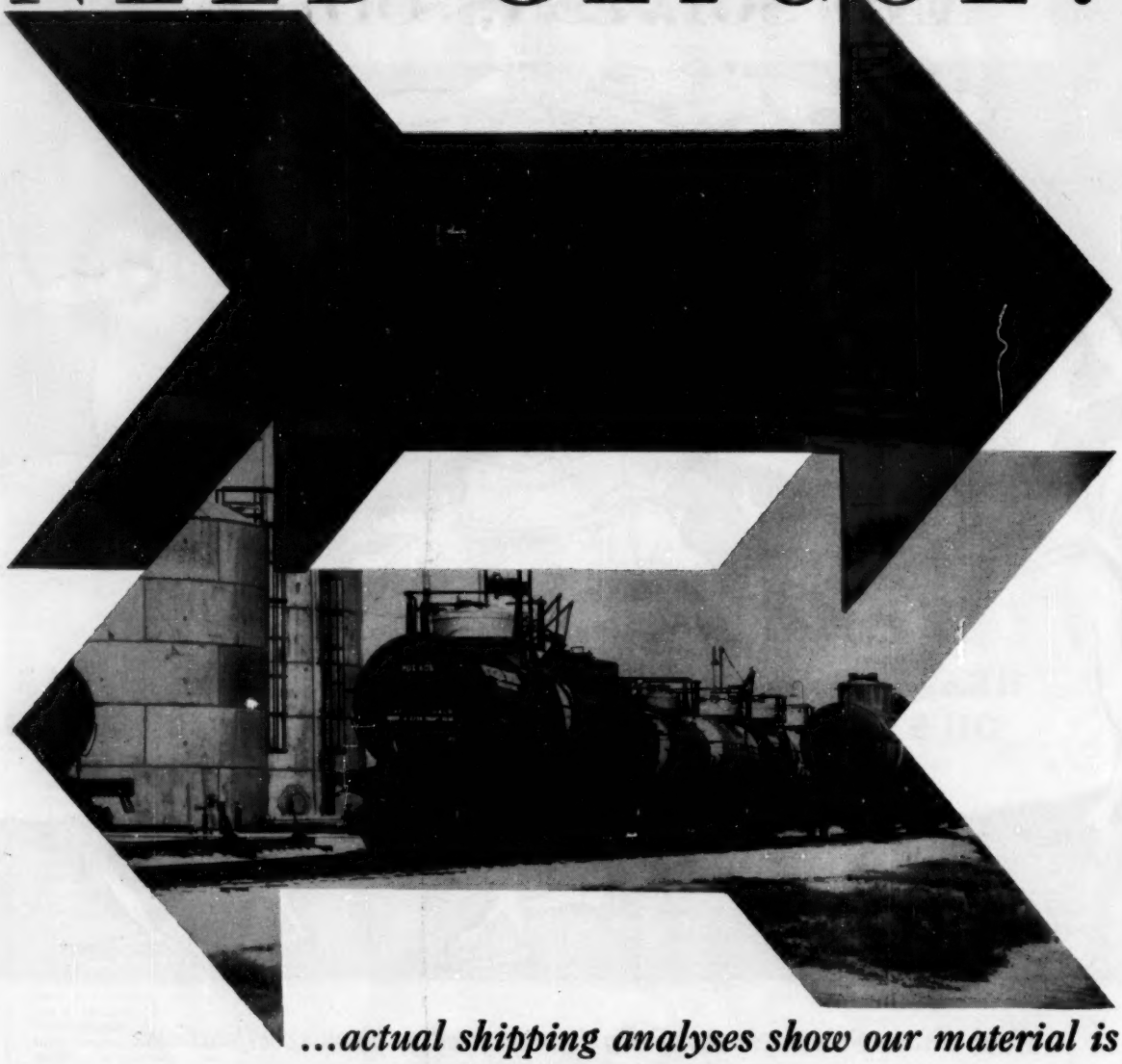

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Business Newsletter

CHEMICAL WEEK
December 1, 1956

News comes in pairs this week.

Two $100-million expansions are ahead for chemical and metallurgical fields. International Nickel will spend that amount in developing its large nickel deposits in the Mystery-Moak Lakes area of Manitoba. The Canadian government will build hydroelectric power facilities to supply the project.

A similar amount will be spent by Aluminum, Ltd., for development of a major bauxite ore deposit in French West Africa *(see p. 25)*.

Bauxite development in Africa can also be paired with possible exploitation of Hawaiian bauxite deposits. Reynolds Metals has just organized a subsidiary, Reynolds Hawaiian Mines, to do business in the territory, as have Kaiser Aluminum and Alcoa. Alcoa's operations will be carried out by its Oregon Bauxite subsidiary. All three say that no deposits have proved to be of commercially exploitable size, but all are continuing to study the area—particularly Kauai and Maui islands. Also reportedly interested in Hawaii bauxite deposits: Aluminum, Ltd., and Climax Molybdenum.

How big might a Hawaiian processing plant be? Reynolds says that if it could obtain mining rights to an economic deposit on territorial land, it would consider a $50-million processing unit.

Two phosphate producers are expanding. Victor Chemical is completing negotiations for a plant site on South Chicago's Calumet River-Sag Canal waterway on which it will put in units to make phosphoric acid and phosphate salts.

But Shea Chemical, another large factor in the phosphate business, is diversifying into fluorine. It has exercised an option on a 266-acre tract on the Ohio River, four miles south of Chester, W. Va., where it will build facilities for making hydrofluoric acid and related products.

There's a pair of acquisitions, too. Vitro Corp. will acquire Berkshire Chemicals, Inc. The chemical sales organization will handle sales of two Vitro divisions—Vitro Mfg. Co. (Pittsburgh) and Vitro Rare Metals (Canonsburg, Pa.)—in addition to continuing its own jobbing business. Berkshire stockholders received Vitro stock worth approximately $320,000.

The joint subsidiary of Hooker Electrochemical and Pennsalt, Chemical Salt Production Co., may acquire Stansbury Salt Co. (Salt Lake City), a firm that has managed development of Chemical Salt's 12,000-acre salt pond operations near Grantsville, Utah. The move would put Hooker and Pennsalt into the marketing of salt products in Utah and surrounding states. Stansbury owners have approved the acquisition.

Two uranium processing mills which together will cost about $10 million, are scheduled to be built in Wyoming and Colorado. A $7-million plant that can process 750 to 1,000 tons/day of ore will be built in Fremont County, Wyoming, by Lucky Mc Uranium Co. The second mill will be constructed at Gunnison, Colo., by Gunnison Mining Co.

There's news, too, on another step in uranium processing conversion of uranium concentrates (from mills such as these) to purified uranium salts.

Of seven companies' proposals to build a uranium salt unit to supply Atomic Energy Commission plants *(CW, Oct. 13, p. 22)*, Allied Chemical's would cost the government the least money. As a result, AEC will negotiate with Allied's General Chemical Division on a five-year contract under which Allied will supply high-purity uranium hexafluoride equivalent in uranium content to 5,000 tons/years of U_3O_8. The plant will be in operation by April 1, 1959.

Allied proposes to use a process that bypasses the usual uranium salt refining step, produces gaseous uranium hexafluoride, which can be used directly by a gaseous diffusion plant such as that at Oak Ridge. Allied will form the hexafluoride from crude uranium concentrates, purify it by distillation.

Since the government will not have to pay costs of changing such other salts as the trioxide or tetrafluoride into the hexafluoride, net cost to the government is the lowest if Allied's plan is used.

•

How chemical is Air Reduction? About one fifth. Its chemical sales now account for 22% of total sales, and acetylene sales are 89% of the chemical sales.

And the emphasis on acetylene and derivatives will continue. Airco next year will build a full-scale acetylenic alcohol plant at Calvert City, Ky., to replace present semicommercial production. Cost estimates of the 3-million-lbs./year unit aren't yet firm, but should be less than $1 million.

•

Minor memos—There's now no worry for Beaumont, Tex., chemical and oil plants that industrial water will be rationed. The Lower Neches Valley Authority has indefinitely postponed its plans to allocate water. . . . Abbott Laboratories, maker of Sucaryl sweetner, has won an injunction preventing Imperial Process Co. (East Springfield, Ill.) from using the name Sucreme for its brand of cyclamate sweetener. . . . Texas Gulf Sulphur began drilling operations off Galveston Island last Saturday. . . . The steroid, 19-*nor*-ethisterone, licensed to Parke, Davis by Syntex (*CW, Nov. 24, p. 22*) shows promise as an oral contraceptive.

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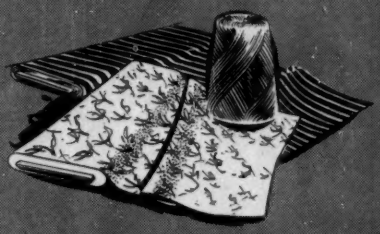
TANNING — There's no substitute for leather, with its rich feeling and distinctive, inimitable smell . . . and nothing quite compares with Mutual Sodium Bichromate and Koreon in the tannery.



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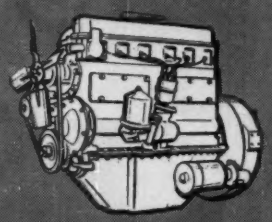

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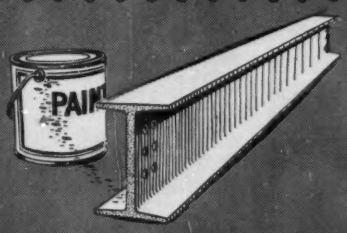

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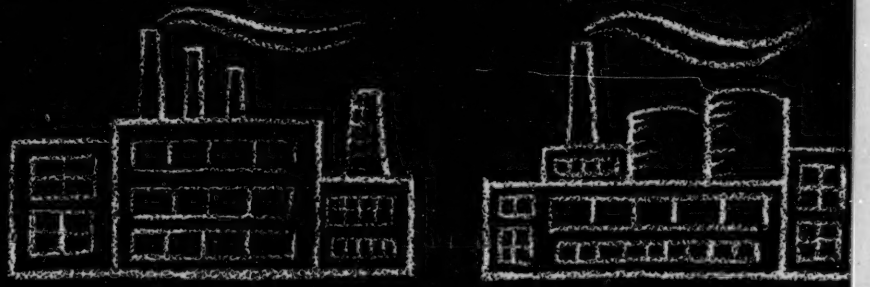

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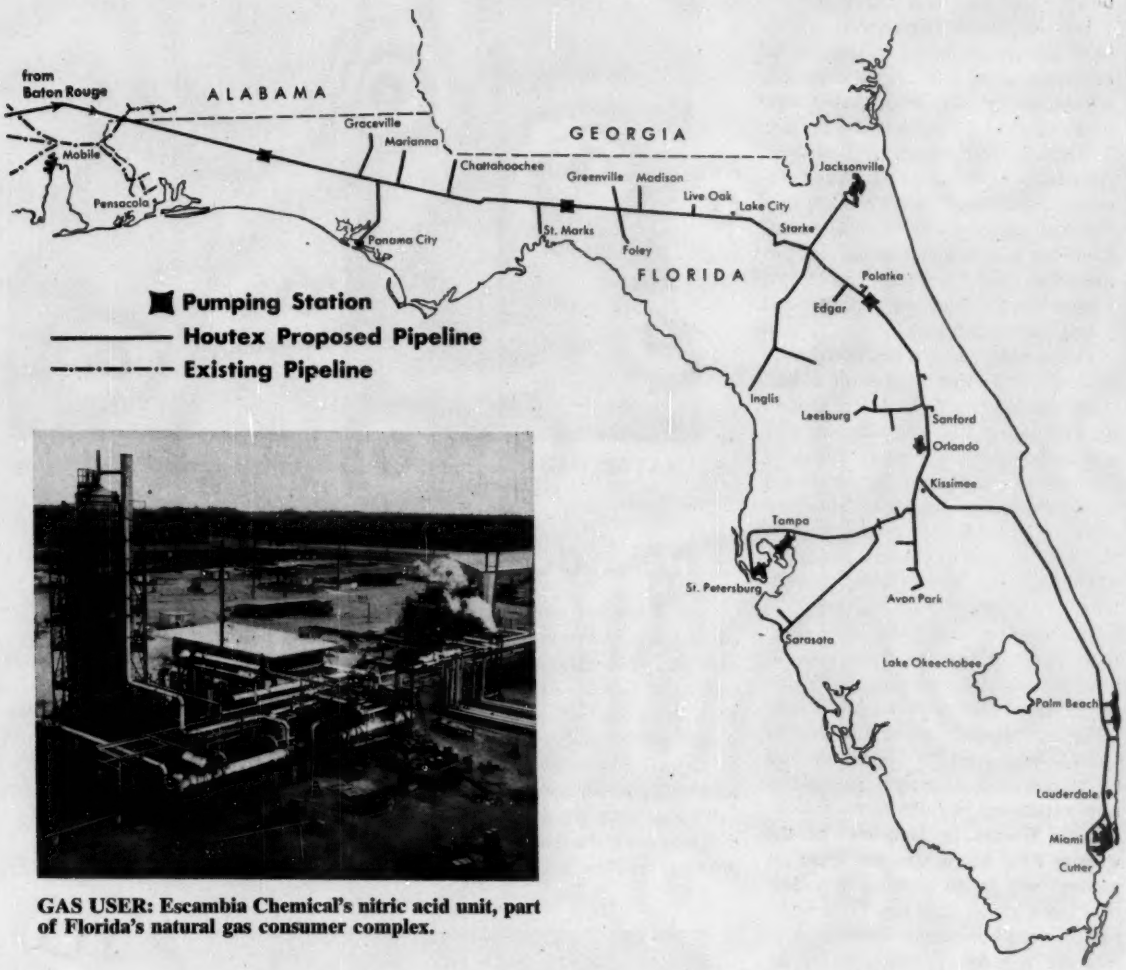

GAS USER: Escambia Chemical's nitric acid unit, part of Florida's natural gas consumer complex.

Coming by '58—Natural Gas in Florida

Hopes for natural gas supplies in Florida are brighter this week, in anticipation of an early Federal Power Commission decision that would allow Houston Texas Gas & Oil Corp. to build its proposed 953-mile pipeline from Baton Rouge to the tip of Florida—thus supplying the last major U.S. population area still lacking natural gas.

Houtex is hoping for a quick FPC decision, since many of its gas purchase contracts with suppliers west of the Mississippi expire Dec. 31, and the contracts will have to be renegotiated—possibly at higher prices—unless the project is approved by that date. But even if approval comes soon, chemical process companies with plants built or planned in Florida may have to wait a year or more before there will be sufficient supplies.

Revised Downward: Houtex's final plans, resulting from considerable revision of proposals of the past two years, call for initial deliveries of 250 million cu. ft./day from Texas to Baton Rouge in a pipeline proposed by Coastal Transmission Corp., thence through Florida (*see map*) by the main 953-mile line and some 640 miles of lateral lines. Houtex originally planned initial throughput of 350 million cu. ft./day, but reduced this when it found few gas producers willing to sell in today's federally regulated market.

Natural gas has been a big drawing card for such chemical enterprises as Chemstrand Corp. and Escambia Chemical Corp., which are utilizing what is presently the sole supply reaching northwest Florida at their plants near Pensacola. This is delivered by United Gas Pipe Line Co. State

development experts say the new supply system would greatly benefit chemical, pulp and paper, and phosphate mining industries in the state, in addition to attracting new industry.

Interest Stirred: Nine chemical firms have already expressed interest in the proposals; three have signed contracts. Altogether the nine would buy a total of more than 17 million cu. ft./day. The companies: American Cyanamid, American Agricultural Chemical, Armour Fertilizer, Buckeye Cellulose, Coronet Phosphate, Davison Chemical Division, International Minerals, Virginia-Carolina Chemical and Edgar Plastic Kaolin. Buckeye, Coronet and Edgar have contracts.

One problem companies would have to face is the sale of gas on a Btu. basis rather than by volume. Consequently, advantages of stripping the gas for chemical purposes might be sadly defeated. Houtex figures it can ultimately deliver the line's designed capacity of 415 million cu. ft./day; the smaller initial delivery estimates are based primarily on limited supplies from producers.

Houtex may bring the state some new electrochemical plants, too. It now has contracts to supply Florida power companies with an initial 150 million cu. ft./day. Some 100 million cu. ft. would go to industries and to private and municipal gas plants now producing manufactured gas.

FPC Worry: In fact, one of the worries FPC has is that too great an amount will go to power and industrial users, rather than to a large number of retail consumers—whose interests are a primary responsibility of FPC.

Though present plans call for payment on a Btu. basis, Florida's rapid growth over the past 10 years has made chemical, paper and other gas-using industries outstanding contributors to the state's economy. The resultant increasing demand might well make Houtex's producing suppliers change their minds, sell gas on a volume basis.

Whatever the outcome, there's little doubt that the proposal has stirred broad interest in Florida. And, judging from the chemical stimulation provided by gas now supplied at Pensacola, it may not be too many years before considerably more of the state is dotted by chemical plants using natural gas as raw material.

SENATOR HRUSKA amplifies a point after session on lobbying.

The Real Get-together

New York last week was the scene of the latest semiannual reunion of members of the Manufacturing Chemists' Assn. Some 900 chemical executives from the U.S. and Canada converged on the Statler Hotel for a day of formal discussions, speeches and informal interchange.

This day, on the surface, was little different from the five previous winter meetings in New York—though there was more frankness in panel talks on business lobbying in Washington and the need for a code of ethics to guide recruiting of college students.

Too, the get-together gave market research men a chance to conduct some informal corporate talk; and salesmen ironed out some 1957 sales contracts.

* Below, from left: Cyanamid's Albert Joe, Ed Nason, George Pradl.

ROSTER READERS*: What next in a busy program?

TOP TRIO: Hercules' Al Forster (left) listens closely to Pfizer's John McKeen. Center: John Hill of Airco.

But the real get-together was with the Society of the Plastics Industry. The most important development last week was the agreement between MCA and SPI on the details of how the use of plastics should best be regulated in a locality's building code.

Why is this important? Many building codes refuse to recognize materials that have been on the market for 20 or more years, let alone newer ones. Many officials responsible for building codes magnify any differences of opinion between resin makers' and fabricators' approaches toward use of a plastic in building. Result: little recognition for plastic usage in building. (*CW, Oct. 8, '55, p. 54*).

Big in Volume: And the stakes are considerable. U.S. Rubber's George Vilas points out that the 500 million lbs. of plastics now sold each year to the building industry represents only 3% of the potential market for plastics in construction.

Cultivation of much of the remaining 97% depends on having building codes that allow use of such materials when they can meet established performance specifications. The MCA-SPI proposal sets up four different classes of plastics of varying flammability and reinforcement standards, and suggests varying limits on their usage in skylights, wall panels, roof panels, interior finish and trim, partitions, and other uses.

What Now? In the past few years, MCA and SPI, depending on volunteers recruited from member companies, have had all they can do to help prepare code provisions for cities and other groups that have requested aid. From now on, with the proposed code in the hands of building officials, there's a chance that there will be even more action. Consequently, the organizations plan to hire full-time staff members to help local authorities with code revisions.

But again, the ultimate responsibility must rest with individual resin makers, not with trade associations that may negotiate the framework within which individual companies may operate.

As Rohm & Haas' Fritz Rarig put it, "We must be worthy of the confidence placed in us by the building industry when they accept our product. . . . Our proposal admittedly places a great responsibility on each of us and admittedly gives broad discretionary power to the building official. I don't think that we have anything to fear from either of these facts. If we meet our responsibility, I am sure that building officials will be receptive to our requests for approvals of materials."

Pollution Control Picks Up

Water pollution control efforts in many states are gaining momentum, a new CW survey shows.

Last week, Tennessee state officials refused to approve the Mead Corp.'s plan to construct a sewer line and a "diffuser" to handle effluent from Mead's Nashville plant. Reason for the decision: the waste would darken the water in the Cumberland River beyond established limits.

Mead's proposal was made in reply to an order by the Tennessee stream pollution control board to submit plans for a treatment or recovery system for its industrial wastes. Mead pleaded that such a recovery plant—which would cost about $2 million—could not be economically justified, that compliance with the order would force closure of the Nashville plant. Mead proposed, instead, a $141,000 sewer line and diffusion installation that would pump waste into the Cumberland River 10 miles downstream from the Nashville business section. The plant now discharges 1.7 million gal./day of untreated waste into the river.

The control board voted to let its order stand and to let the matter pass until its May, 1957, meeting.

Other Developments: In Texas, the state water resources committee has drafted legislation for the creation of a nine-member water pollution control council, including heads of state departments now dealing with pollution laws. The new council would be empowered to set pollution standards as they would apply to different localities.

Texas industrial interests have submitted a rival plan, which suggests setting standards of water quality and purity according to rivers and areas.

The committee, meanwhile, has put final touches on a bill to regulate injection of industrial wastes (particularly from oil fields) back into the earth. Permits would be obtained from the state railroad commission if oil and gas are involved; otherwise, the application would go to the state board of water engineers. Under the proposal, violators could be jailed for 30 days and fined $100.

Missouri Legislation: The Missouri water pollution control committee has approved a broad pollution control bill for submission to the 1957 state legislature. Committee chief Robert Weatherford calls it "a bill that can be supported by every citizen and every group." He thinks it's flexible enough to meet the need of industries, small cities and other water users, without use of any "mandatory ultimatum."

In Maine, the state water improvement commission has submitted recommendations to the 1957 legislature on classification of streams. Under Maine law, all water courses are to be placed in one of five classes ranging from water pure enough to drink to water in streams used as carriers of waste. The legislature has already classified about half the 15,000 miles of streams in the state, and the commission hopes to present recommendations in January on all the rest—except for the lower ends of the larger rivers.

Ohio Report: The Ohio River Valley water sanitation commission reports that 965 of the 1,438 plants discharging their effluent into the streams of the valley are now complying with the commission's requirements. A five-year-old riverwater-monitoring system, with stations at 41 points, is providing the commission with essential data for appraisal of pollution control measures and for surveillance of how well municipalities and industries are complying with requirements.

Potomac River-area industries are watching Interstate Commerce Commission activities in the Potomac River basin. The commission has scheduled a series of meetings to consider suggestions that it seek legislative authority to issue and enforce pollution orders and to fix mandatory cleanliness standards for the Potomac and its tributaries.

The commission retained Johns Hopkins professor Abel Wolman and associates as sanitary engineering consultants for stream pollution studies in the Washington metropolitan area—first step in development of a comprehensive master plan to abate Potomac River pollution. The study will take about nine months, use most of this year's $16,000 grant to the commission under the new Federal Water Pollution Control Act.

EXPANSION

Vinyl Resins: Pathfinder Chemical Corp., division of Goodyear Tire and Rubber, will spend $4 million to expand its Niagara Falls, N.Y., vinyl resin and latex materials plant. Completion of the plant is anticipated by July '57.

•

Industrial Gases: Imperial Oxygen Ltd. will build a $100,000 oxygen and acetylene plant in the Burnaby district of Vancouver, B.C.

• Air Reduction Co. is building a $6.5-million industrial gases plant on a new site in Chicago. Completion: third quarter, 1957. Capacity: 75 tons/day of oxygen, nitrogen, argon.

• Linde Air Products Co. is building an oxygen and acetylene production plant at Seven Islands, Que. The plant is scheduled to go onstream early in 1957.

•

Adhesives: Minnesota Mining & Mfg. Co. will build a chemical plant on 21 acres it has just purchased in Newark, N.J.

COMPANIES

Carborundum Co. will sell $15 million worth of 4½% notes, due Oct. 1, '76, to institutional investors. Proceeds will help finance the company's $30-million capital expenditure program for 1957-58.

•

Archer-Daniels-Midland has purchased a part of the alkyd resin business of General Electric Co. Transferred interests include inventories, equipment, formulations and manufacturing specifications of GE's Glyptal alkyd resins production at Schenectady, N.Y.

•

Continental Uranium, Inc., has purchased Transit-Mix Concrete Co., Daniels Sand Corp. and Pacific Materials Corp.

•

Bowater Corp. of North America will reportedly offer publicly $7.5 million of its 5½%, $50-par cumulative redeemable preferred stock. Price is expected to be 47¾, to yield 5.75% to investors.

•

Mobay Chemical Co., Ltd., has been authorized to incorporate as a federal company in Canada, with capital of 50,000 shares, no-par value.

Washington Angles »

» An attempt to mollify chemical makers and other bulk-product manufacturers who oppose the Patman-Kefauver "equality of opportunity" bill is under consideration by bill sponsors. Lawyers insist that the proposed law, as now written, would not only eliminate the "good faith" defense of price discrimination under the Robinson-Patman Act but would also prohibit pricing on a delivered basis.

Under study: a proposal to include in the bill a statement declaring that it would be Congress' intent not to prohibit delivered prices.

The bill, almost passed last year, stands a good chance of passage in '57. But its chances would be somewhat better if the smaller retail organizations pushing enactment can get around present heavy-industry opposition.

» Pirating of government chemists, engineers and other technicians by defense contractors will come up for Congressional attention at hearings starting Dec. 10. Representative Davis (D., Ga.), chairman of a House Civil Service subcommittee, says he will explore with Pentagon officials methods to "check undue competition" for scientists and "eliminate the possibility of any pirating."

He charges that private contractors financed by government cost-plus contracts are luring federal engineers and scientists with offers of higher pay in industry.

« Will an electrochemical producer have to pay the government more money than it's now scheduled to? Yes, if Interior Secy. Fred Seaton has his way. Seaton has asked the Federal Power Commission to review a 30-year contract signed in 1952 between the government's Southwestern Power Administration and Reynolds Metals Co., to see if it conflicts with a 1944 law.

If it does, he wants to raise Reynolds' present 5.2-mills/kilowatt-hour charge to the amount other SPA customers are paying.

And other SPA users, too, may be in for rate boosts. FPC will soon be asked to approve a rise in rates to a minimum of 6.97 mills.

FOREIGN

Rutile / West Africa: Columbia Southern Chemicals Co. and British Titan Products, Ltd., will form a subsidiary to develop rutile deposits in the Bonthe district in Sierra Leone, West Africa.

•

Pharmaceuticals/Netherlands: Haco N. V. and Dolcin Corp. have formed a company to manufacture pharmaceuticals and chemicals in Holland. Haco will manage the jointly owned company.

•

Explosives/Rhodesia: African Explosives and Chemical Industries is building a $9.8-million superphosphate factory near Salisbury, Southern Rhodesia. It is scheduled for completion Jan. '58.

•

Petrochemicals/Australia: Australia's first petrochemical venture, Petroleum and Chemical Corp. Ltd., has shown a deficit for its first year of operation. The loss, amounting to $170,000, has been blamed on defective gas-making units.

•

Coal Chemicals/Australia: Australian industrialists are meeting with the Australian Joint Coal Board to discuss plans for a $130-million coal-utilization project. Tentative plans provide for a three-stage building program that will include a plant to produce tar, char, gas and light oil, a plant to turn out acetylene, methanol, ammonia, and nitric acid as well as units to manufacture plastics, synthetic fibers and synthetic rubber.

•

Coal Chemicals/South Africa: Associete des Charbons de Lukuga will process coal in Belgian Congo to produce 80,000 tons/year of motor spirit, 30,000 tons/year of diesel oil, and smaller quantities of paraffin and lubricants. The company was recently formed with a capital of $840,000.

•

Styrene/Scotland: Forth Chemicals Ltd. will spend $56 million to expand its styrene monomer plant at Grangemouth, Scotland. The new facilities will double the present capacity of over 30,000 tons/year.

•

Alumina/French West Africa: Aluminium Ltd. will make an initial investment of $100 million in a wholly owned French subsidiary, Bauxites du Midi, to start a bauxite and alumina industry in French West Africa. Plans call for development of new bauxite deposits in northwest Guinea and the construction of a 250,000-tons/year alumina plant with attendant rail and housing facilities. Construction will start in 1957; first shipments are scheduled for 1960.

•

Tungsten/Chile: National Tungsten Corp. has acquired from Kolombo International Corp. a 50% interest and exclusive operating and management rights to north Chile mining property estimated to have current market value of $1.5 billion. Estimates place over-all size of ore bodies of tungsten, mercury and manganese in excess of 75 million tons. Production of 2,500 tons/day of ore is expected to be achieved within eight months.

•

Resins/Holland: Archer-Daniels-Midland Co. has entered into an agreement with Dutch plastics manufacturer Scado (Zwolle) to establish a jointly held synthetic resin manufacturing operation in Holland.

•

Petrochemicals/Japan: Teikoku Oil Co. has applied to the Osaka Trade and Industry Bureau for permission to prospect and drill natural gas wells in a 93,000-acre area in the Lake Biwa region. The wells involved would be the first drilled to supply natural gas for industrial purposes in western Japan. If development is successful, the company will build ammonia and methacrylate resin units. Further plans call for production of ammonium sulfate and synthetic fiber.

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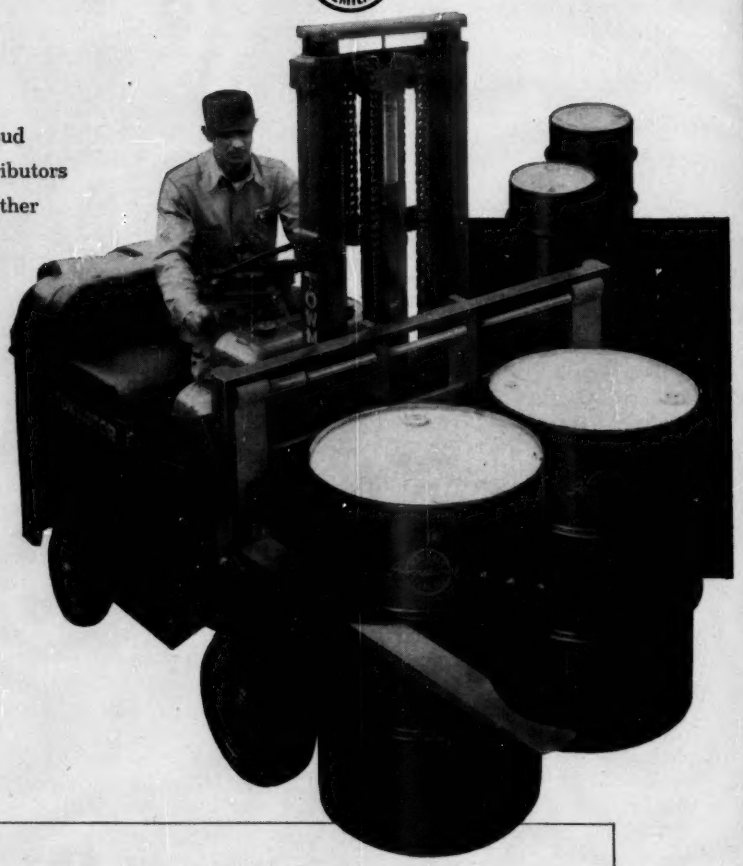

We, here at *International*, are mighty proud of our nation-wide organization of 23 Distributors of *Caustic Potash* and a wide variety of other industrial chemicals. Each was carefully selected as the best qualified chemical sales and service organization in his local area. Many of these same companies are large and experienced manufacturers of their own industrial chemicals. These Distributors offer fast, convenient service from warehouse stocks, frequently at lower delivered prices than direct shipments. Because they give you the same prompt, helpful cooperation you receive from our own sales offices, we like to think of them as our partners.

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including these *International* products . . .
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Phone: Gaspee 1-0262

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Headquarters: 1945 E. 97th St.
Cleveland 6, Ohio
Phone: Randolph 1-8300

HYDRITE CHEMICAL CO.
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Life ...on the Chemical Newsfront

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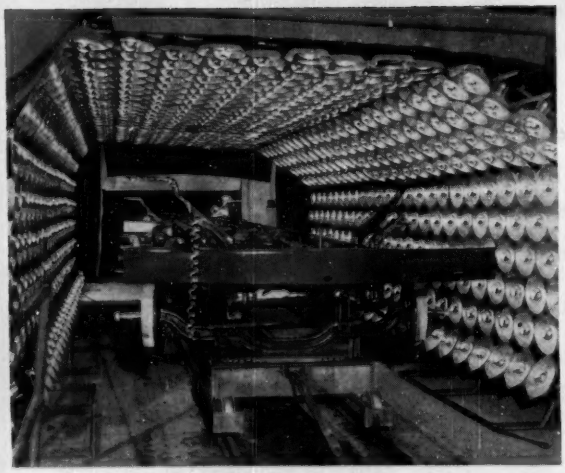

FASTEST DRYING PAINTS EVER MADE are formulated from styrenated alkyd resins modified with Cyanamid's Acrylonitrile. Baking enamels can be dried in five minutes at 300° F. Typical air-dry paints are dust-free in 5-10 minutes, tack-free in 10-15 minutes, and hard-dry in less than half an hour. These fast-drying films are harder and tougher, more resistant to chemicals and solvents, and display remarkable resistance to bronzing and chalking. The use of Acrylonitrile as a co-monomer has similarly improved physical and chemical properties in a wide range of products. **(Organic Chemicals Division)**

THE MEDITERRANEAN FRUIT FLY seriously threatened the Florida citrus industry this summer. It is being controlled with area-wide aerial and ground spraying with Malathion, Cyanamid's recently developed broad-spectrum insecticide. View above shows spraying in the Miami Beach area. When the "Medfly" last invaded Florida in 1929, 75% of the state's citrus crop had to be destroyed in a two-year drive to effect control of the infestation. Malathion-bait spray is expected to control the infestation efficiently without such drastic loss to Florida's agriculture.
(Agricultural Chemicals Division)

NEW HEIGHTS IN SAFETY AND STRENGTH: Putnam Rolling Ladder Company utilizes sandwich construction of glass fiber and LAMINAC® Polyester Resin to create lightweight ladders with nonconducting properties that make them ideal for power and electrical work. Noncorrosive properties and superior strength recommend these ladders for chemical plants—in fact, they're excellent for any kind of plant under any kind of condition. LAMINAC Resin and glass fiber are also combined in the fabrication of boats, chemical processing tanks, structural building panels and automotive equipment.
(Plastics and Resins Division)

ADD SPARKLING WHITE GIFT WRAPPERS to the applications for "whiter-than-white" papers made possible with Cyanamid's CALCOFLUOR® PMS Concentrate optical brightener. Where eye-appeal counts, papers treated with CALCOFLUOR stand out because the ultraviolet portion of light is converted into a visible blue-white, adding whiteness and brightness to the paper. CALCOFLUOR optical brighteners are well established as textile and detergent aids. Their use is also rapidly increasing in paper because of the unequalled contrast given to typography and illustration by these brilliant white papers.
(Organic Chemicals Division)

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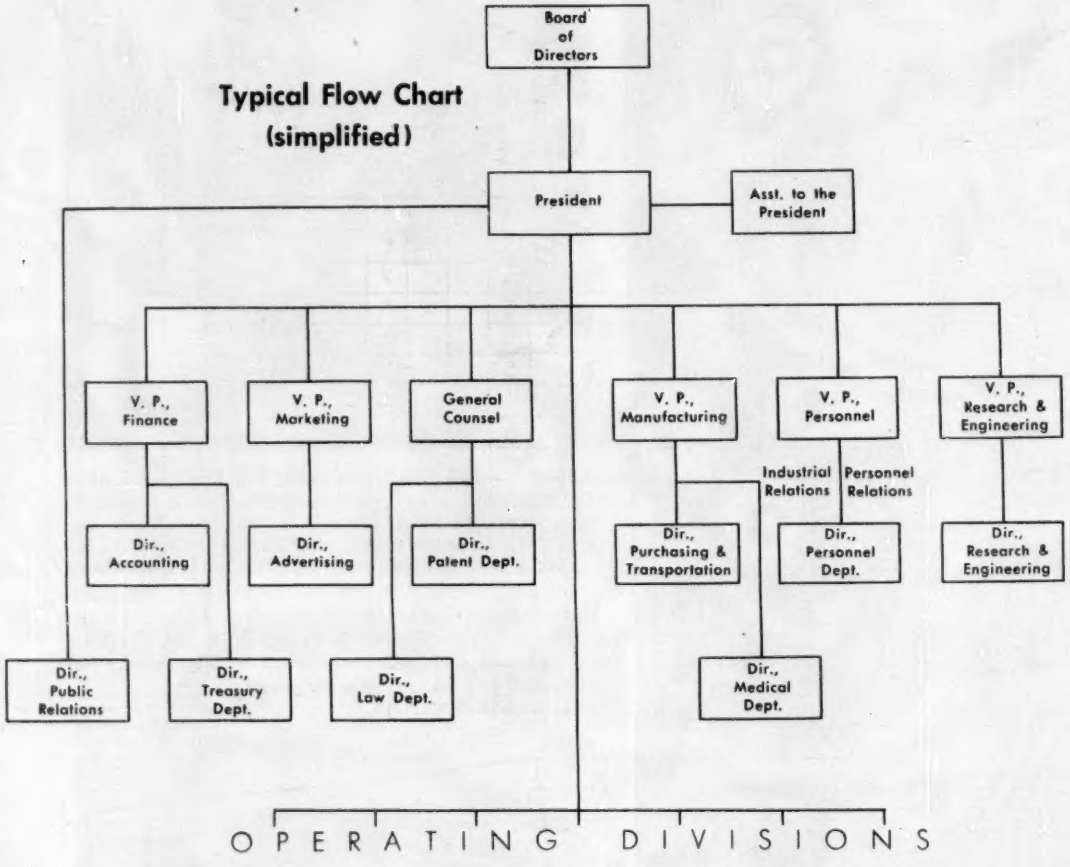
Additional information may be obtained by writing on your letterhead to the Division of American Cyanamid Company indicated in the captions.

Building for the Future Through Chemistry

'Flow Chart' vs. LRC: Who's Who, or Who Does What?

Hypothetical tables of organization for large, diversified chemical company



Spotting Traffic Jams in Decision Making

Increasing dissatisfaction with traditional "flow chart" organizational diagrams has spurred a number of chemical process companies in Canada into switching to a new system of charting job titles and functions.

The new method—conceived by Dutch consultant Ernst Hijmans—is called "linear responsibility charting" and is described as a graphic method of analyzing and recording:

- Corporate, divisional and departmental organization structure.
- Job content and interjob relationships.
- Functional operating responsibilities and authority.

There's always been doubt that flowchart diagrams—originating from military "chain of command" tables of organization—are really suitable for commercial or industrial units. That doubt has been building up as business entities have become larger, more complex, and more dependent on "pooled brainpower" implied in management's concern about keeping channels of communication open and use of "brainstorming" techniques. One way to make up for some of the flowchart's deficiencies has been to supplement it with an organizational manual that tends to become more unwieldy with each year's additions and changes.

Clearer and Briefer: LRC's big asset, according to two of its principal advocates—James Simpson and Frank Judge, of Leetham, Simpson Ltd., a Montreal consulting firm: it gives

Linear Responsibility Chart (excerpts)

KEY TO SYMBOLS

- X Work is done
- 1 General supervision
- 2 Direct supervision over work done
- 3 Supervision with coordination
- 4 Decision on points specifically submitted
- 5 Person must be consulted
- 6 Person must be notified
- 7 Person may be called in for exchange of views

		President			Finance			Marketing		Legal			Manufacturing			
	Board of Directors	President	Assistant to President	Director, Public Relations	Vice-President, Finance	Director, Accounting	Director, Treasury Dept.	Vice-President, Marketing	Director, Advertising	General Counsel	Director, Law Dept.	Director, Patent Dept.	Vice-President, Manufacturing	Director, Purch. & Transp.	Director, Medical Dept.	Vice-President, Personnel
Establish over-all company objectives	1	X	7		5			5		5			5			5
Approve over-all company plans	1	X	6	6	5			5		7			5			5
Direct over-all operations	1	X			7			7		7			7			7
Approve company expansion plans	1	X		6	5			5		6			5			6
Control public relations	1	X		5												
Coordinate line and staff departments	1	X	7		5			5		5			5			5
Assist president in administrative routine		2	X													
Conduct organization studies		1	X		5			5		7			5			5
Conduct over-all public relations	7	2		X												
Provide service to stockholders		1		X	7											
Safeguard corporate funds	4	1			X	7	7									
Decide on tax matters		1			X		5			7						
Coordinate over-all operating budget	6	1			X	5		5					5			
Determine financing needs		1			X	5										
Determine over-all marketing policies		1						X	7							
Over-all sales forecast	6	1			6			X					6			
Coordinate product expansion plans		1			5			X					5			
Plan company-wide advertising	6	4			5			1	X				7			6
Administer legal matters		1			7					X						
Interpret legislative changes		6								1	X					

management "a visual picture of job relationships without having to wade through a heavy volume of reading material." This means, they say, less chance of misinterpreting the meaning of various relationships and responsibilities.

By means of a series of symbols—such as those used in the hypothetical example (*above*)—LRC provides a quick picture of (1) responsibility for getting work done, and (2) procedure to be followed in taking action and making decisions.

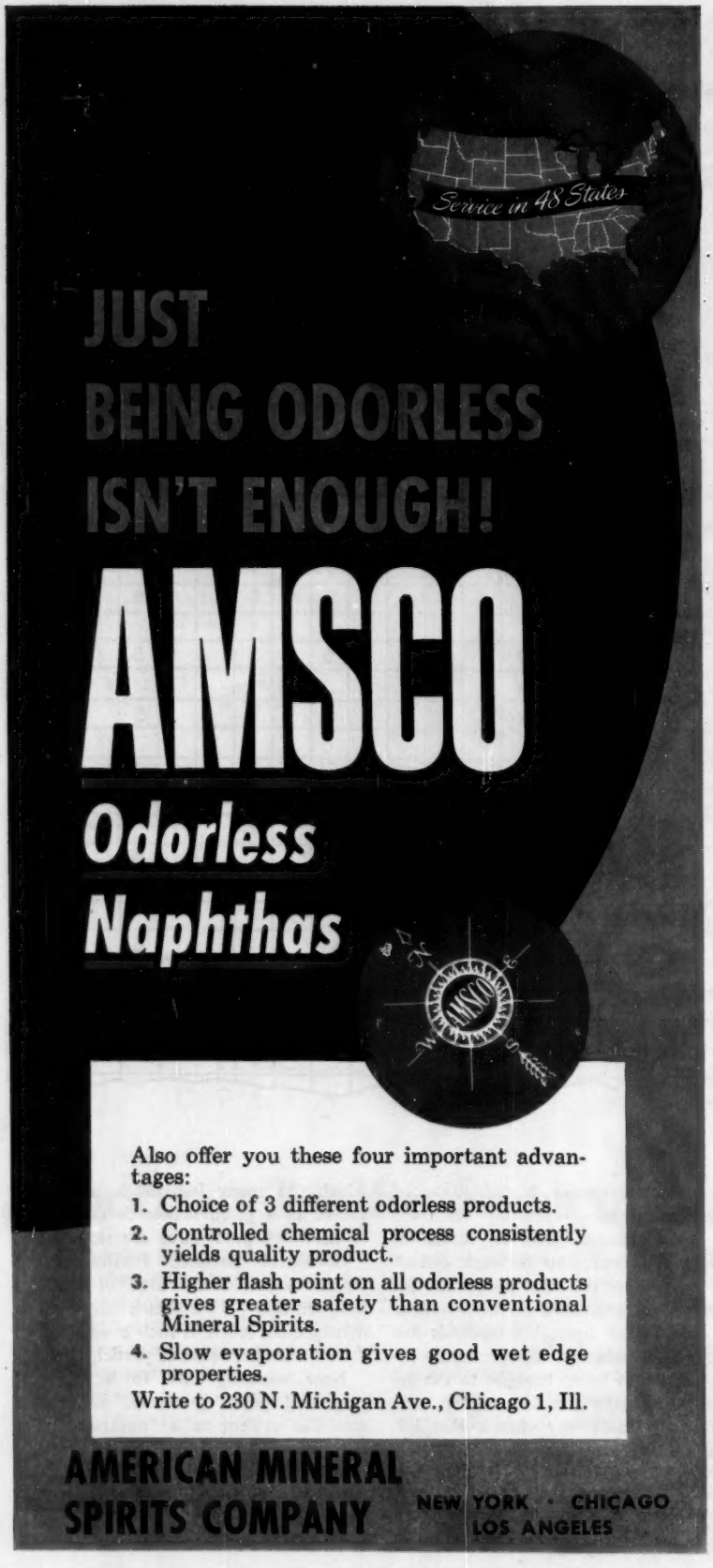
Simpson and Judge hold that a properly prepared LR chart will show;

- Inconsistencies in delegation of responsibilities.
- Unbalanced jobs in terms of work load and class of work done.*
- Whether the right people are informed or consulted on each action.
- Whether operating methods are adequate, whether all pertinent information is being brought to the attention of the decision maker, and whether there's any chance that job functions have been misunderstood.
- Any "red tape" problem, in which too many individuals are involved in a given action or decision or in which procedures are slow.

*To determine imbalance in class of work done, work is classified as "routine," "supervisory" or "executive," and percentage of time spent in each type of task is computed.

Bottleneck Breaker: Possibly the biggest argument in favor of LRC, Simpson told *CW*, is that it covers all management levels in such a way that there's a livelier sense of participation.

Now installing LRC for a major pulp and paper producer, Simpson sees this system as a "natural" for chemical process companies, large and small. Often, he added, it's the small company—where one man represents a bottleneck in decision making—that needs LRC most.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LEGAL

International Antitrust: Chemical process companies can expect closer government inspection of their foreign activities to result from a recent Supreme Court ruling broadening the power of U.S. courts to deal with international aspects of antitrust violations.

The high court's ruling upheld a decision by U.S. District Judge Mell Underwood (Columbus, O.) charging Holophane Co., Inc. (New York), with violation of U.S. antitrust laws. The court agreed unanimously that the prismatic glassware manufacturer had violated antitrust laws by dividing up world markets with its former parent firm, Holophane Ltd., a British company, and with La Societe Anonyme Francaise Holophane, a French manufacturer. Both foreign companies were named as co-conspirators.

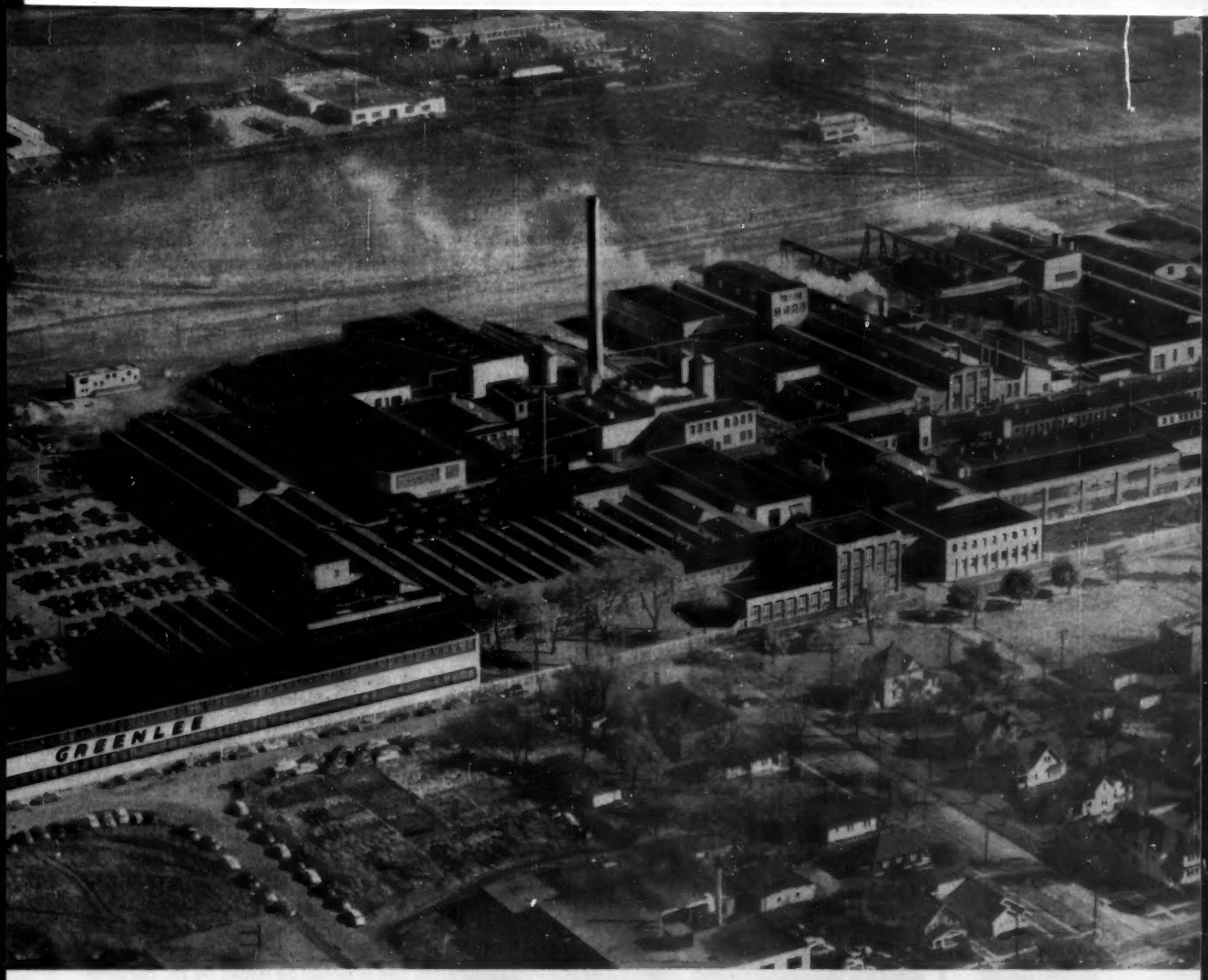
The justices split 4-4, on the lower court's decision to force the U.S. concern to compete in foreign lands. However, a Supreme Court tie automatically upholds a lower-court decision.

Judge Underwood—despite Holophane arguments that the international agreements granting each of the three companies certain rights in certain areas of the world were in effect when the company was purchased by its U.S. owners—ordered the glass maker to use reasonable efforts to sell its own products in foreign markets, including markets now held by the co-conspirator companies. It had been Holophane's contention that a court with jurisdiction over only one member of an international agreement cannot force the U.S. company to perform "affirmative acts" that violate the agreement.

The glass manufacturer further contended that the lower-court ruling may make it vulnerable to damage suits in foreign nations for violating the agreements now held illegal.

Holophane Co. told *CW* it will "abide by the law," and that it prefers "to leave well enough alone at this time."

There is speculation as to what effect this ruling might have on foreign U.S. subsidiaries producing products for sale only in the country of manufacture. Whether the Justice Dept's. antitrust chief, Victor Hansen, can get the courts to force such sub-



Greenlee cuts steam costs 18%-20% burning coal the modern way

Consult an engineering firm

Designing and building hundreds of heating and power installations a year, qualified engineering firms can bring you the latest knowledge of fuel costs and equipment. If you are planning the construction of new heating or power facilities—or the remodeling of an existing installation—one of these concerns will work closely with your own engineering department to effect substantial savings not only in efficiency but in fuel economy over the years.

facts you should know about coal

In most industrial areas, bituminous coal is the lowest-cost fuel available • Up-to-date coal burning equipment can give you 10% to 40% more steam per dollar • Automatic coal and ash handling systems can cut your labor cost to a minimum. Coal is the safest fuel to store and use • No smoke or dust problems when coal is burned with modern equipment • Between America's vast coal reserves and mechanized coal production methods, you can count on coal being plentiful and its price remaining stable.

Expanding facilities at Greenlee Bros. & Company, Rockford, Illinois, created a problem common to many growing firms. The Company's three old boilers had to operate continually at maximum capacity, so that a forced outage could hurt plant production. In addition, peak load operation with outmoded equipment resulted in high fuel costs.

While the newest boiler was retained, Greenlee replaced the other two with modern high-capacity units, including stokers, up-to-date controls and other equipment for more efficient operation. A new, pneumatic ash handling system was installed. Today Greenlee is getting 10%-20% more steam for each pound of coal burned and steam costs are down 18%-20%, saving Greenlee thousands of dollars every year.

For further information or additional case histories showing how other plants have saved money burning coal, write to the address below.

BITUMINOUS COAL INSTITUTE

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sidiaries to compete in other areas—possibly this country—remains to be seen.

•

Chemical Spray Suit: Bowaters Southern Paper Corp. (Calhoun, Tenn.)—a subsidiary of Bowaters Paper Corp. Ltd. (London)—and Stull, Inc. (Sebree, Ky.), have been named defendants in a chemical spray damage suit now under petition for removal to district court in Chattanooga.

The defendants have been charged by a Rhea County, Tennessee, farmer, J. B. Swafford, Jr., with destroying $8,460 of his crops as a result of aircraft-spraying of certain of Bowaters' lands. In addition to actual damages, Swafford is suing for $5,000 punitive damages. The farmer charges that Stull—the crop-spraying company—operated in Tennessee without complying with state regulations.

The petition for removal to federal court alleges diversity of citizenship. Bowaters is incorporated in Delaware.

New Lures for Plants

Process management men who are window-shopping for new plant site bargains are noting that at least one state government has obtained voter approval on three new moves for industrial development.

Louisiana voters approved a constitutional amendment adding Ascension Parish to the Greater Baton Rouge Port Commission, and increasing the commission's bonding capacity to $50 million. The voters also authorized port authorities to lease property for 99 years for industrial development and to issue revenue bonds for construction of facilities to be leased. A third approved amendment created the Greater Ouachita Port Commission with power to issue $15 million in revenue bonds.

On the other hand, Louisiana electors turned down a proposed amendment to the state constitution to increase the bonding capacity of the Sabine River Authority to $50 million and to ratify statutes empowering the authority to build irrigation, flood control and power projects.

To Promote Industrialization: While not as yet submitting specific amendments for voter approval, numerous states are undertaking programs to attract additional industries and encourage industrial expansion.

In Alabama, Gen. Lewis Pick, director of the State Industrial Development Board, has proposed enactment of legislation that would permit formation of a privately financed development credit corporation to provide small industry risk capital unavailable through normal channels.

And in another Alabama development, State Docks Director Ward McFarland announced plans for a $5-million expansion of dock facilities at Mobile, to be completed within a year.

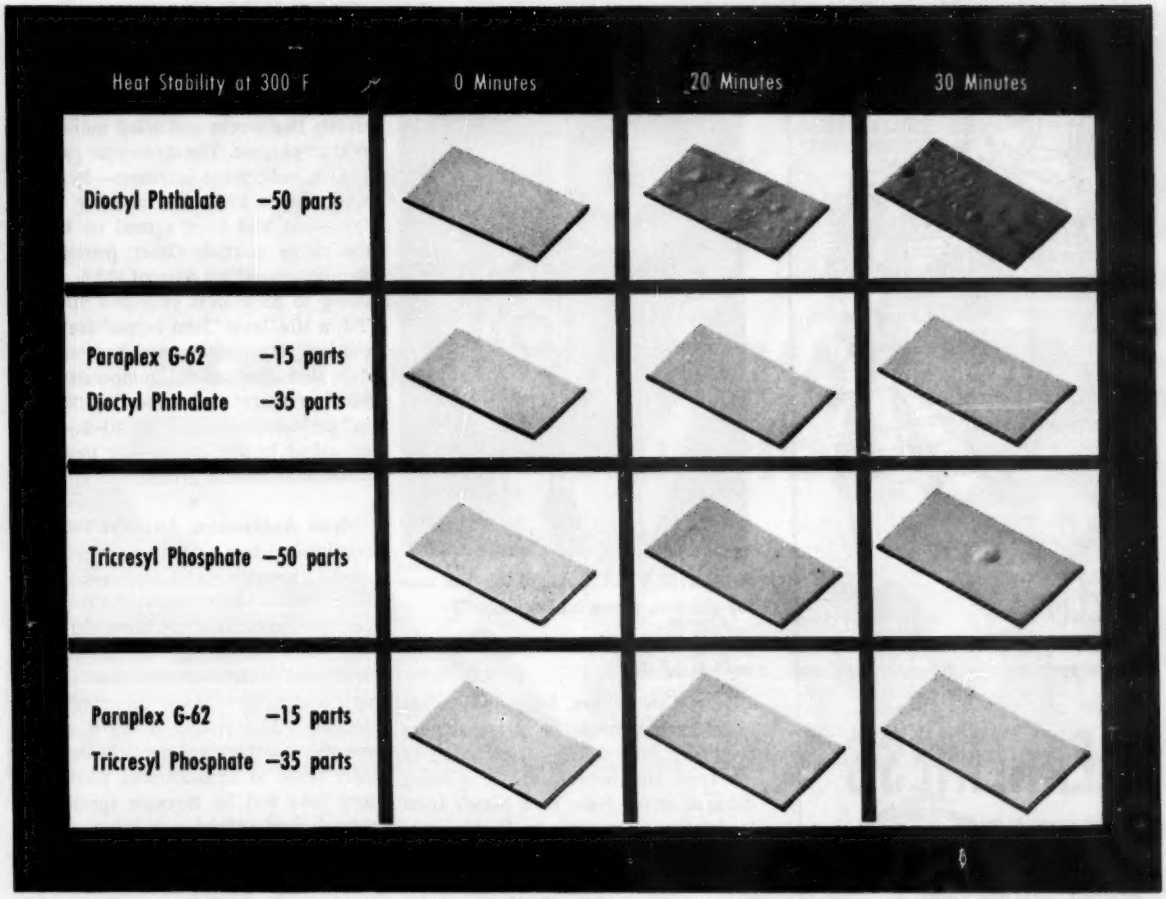
State officials and private citizens in Arkansas have suggested a plan for raising millions of dollars for industrial expansion, one phase of which would call for adoption of a constitutional amendment to permit cities to issue municipal bonds for industrial development. These bonds would then be traded for bonds issued by a private nonprofit financing corporation. The corporation, in turn, would sell the municipal bonds to state banks. Other bonds would be issued by the corporation for sale to the state. The state might be asked to provide $10 million to buy the bonds.

Both New York and Pennsylvania have acknowledged the advantages of advertising by authorizing plans to seek $600,000 and $200,000, respectively, to promote industrial development. The Keystone State, in addition, plans to sponsor a basic study of the state's opportunities in the chemical industry. The study—made under contract with Carnegie Tech engineers—is expected to open opportunities for new growth in that field, utilizing salt rock, high-calcium limestone, and more by-product wastes from existing industry.

Not all state and local activity can be construed as favorable to industrial expansion, for as many areas grasp every opportunity to attract industry, others—like Baltimore, whose mayor has proposed a property tax on manufacturers' machinery and inventory—seek to impose restrictions.

Cook's Tour for Bankers

NOT AVERSE to becoming better known to the financial world, Vitro Corp. of America (New York) last fortnight took a group of eight bankers and three other U.S. businessmen on a six-day tour of its plants and offices in seven states. Stops were at engineering activities in New York and Tulsa, Okla.; at research and development laboratories in West Orange, N.J., and Silver Spring, Md. (*above*); and at manufacturing plants in Martinsburg, W. Va., Aiken, S.C., and Chattanooga, Tenn. At present, Vitro stock is being traded on an over-the-counter basis, but Vitro—whose growth program calls for continued expansion into chemical processing—is contemplating "big board" listing.



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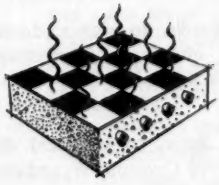

PARAPLEX G-62 simplifies the manufacture of vinyl floor tile . . . gives added life to tile in use.

The samples of vinyl floor tile above illustrate the superiority of PARAPLEX G-62 over conventional plasticizers in providing heat stability to vinyl compounds. This stability lets you mill vinyl compounds at high temperatures . . . helps keep them from deterioration and discoloration. The result? Shorter processing cycles, increased production.

In use, vinyl compounds such as tile also benefit from PARAPLEX G-62. Because the plasticizer is relatively non-volatile, loss from tile laid over radiant heating, for example, is held to a minimum. In addition to all this, PARAPLEX G-62 resists attack by ultraviolet light and extraction by soap, detergent, fat, grease, and oil.

For more information on all of the plasticizers produced by Rohm & Haas Company, ask for *What You Should Know About* PARAPLEX *and* MONOPLEX *Plasticizers.*

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WIDE WORLD

ASSEMBLYMAN AUSTIN: For senior citizens, a ban on "age bias"?

LABOR

New Compulsion Argued: Whether "fair employment practices" codes should include a ban on rejecting of job applicants because of age is being debated before New York State's Joint Legislative Committee on Problems of the Aging. At a recent session with Brooklyn Assemblyman Bernard Austin presiding, three spokesmen for organized labor urged that such a law be enacted at the legislature's 1957 session that starts next month; an official of the New York Commerce & Industry Assn. took the opposite stand. Both parties, however, promised that their organizations would cooperate in educational campaigns aimed at persuading employers to hire workers who are 45 or older.

•

No Weekend Tax Loss: A new Labor Dept. policy permits employers to give employees longer holiday weekends without being entangled in provisions of federal overtime pay laws. Under the new interpretation, a sixth workday in a single week will not be counted as overtime if it's mutually agreed on in advance as a means of giving employees an extra day off on a holiday weekend—such as the Monday before Christmas this month.

•

Steelworkers End Strike: A second strike this year by the United Steelworkers of America (AFL-CIO) against a major chemical company ended last month. This strike—at the Dow Chemical Co.'s magnesium fabricating plant at Madison, Ill.—lasted nearly five weeks and idled more than 600 employees. The three-year pact includes basic wage increases—9¢/hour now, 8¢ in 1957 and another 8¢ in '58—that had been agreed on before the strike started. Other provisions: Sunday premium pay of 25% now, rising to 35% next year and 50% in '58; a 10¢/hour "heat bonus" for alloy castings department employees on any day that the official temperature is 90 F or more; and a five-day "break-in" period—instead of the 30-day period asked by the union—for new employees in certain production jobs.

•

New Automation Anxiety: That the continuing trend toward automation might close the gates on workers aspiring to rise from the ranks into upper management is the latest foreboding on increasing mechanization. William Westley—chairman of sociology and anthropology department at McGill University (Montreal)—sounds this warning, predicts that the only route to advancement from factory jobs will be through specialized schools and intensive training.

KEY CHANGES

Stanley B. White, to vice-president, Kaiser Aluminum & Chemical Corp. (Oakland, Calif.).

John J. O'Connell, to vice-president, marketing; and **John W. Bertetti,** vice-president, manufacturing; Amoco Chemicals Corp. (Chicago), affiliate of Standard Oil Co. of Indiana (Chicago).

Albert J. Berdis, to vice-president in charge of aluminum fabricating, Olin Mathieson Chemical Corp. (New York).

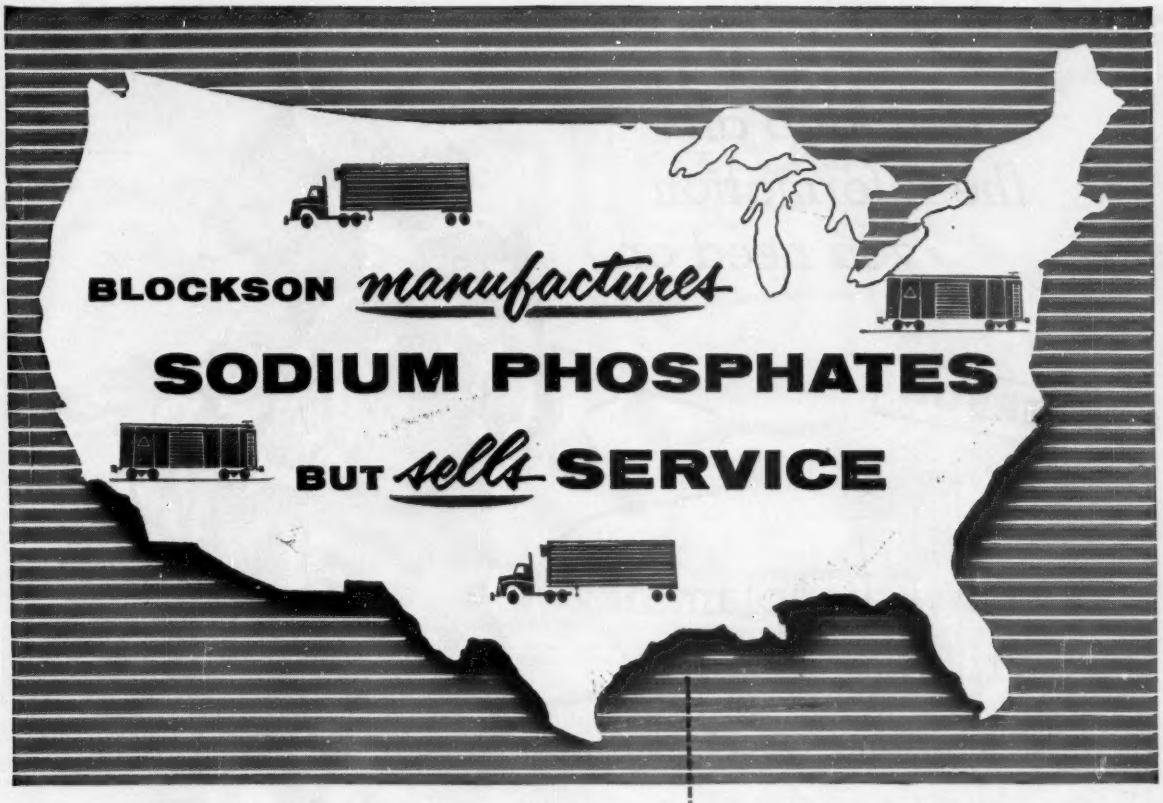
Harold R. Suter, to technical director, J. B. Ford Division, Wyandotte Chemicals (Wyandotte, Mich.).

E. C. Sargent, to president, Zirconium Corp. of America (Solon, O.).

Leo B. Grant, to sales manager, Chemicals Dept., Dow Chemical (Midland, Mich.).

DIED

William B. Wingert, 55, vice-president, Semet-Solvay Division, Allied Chemical & Dye (New York), at White Plains.



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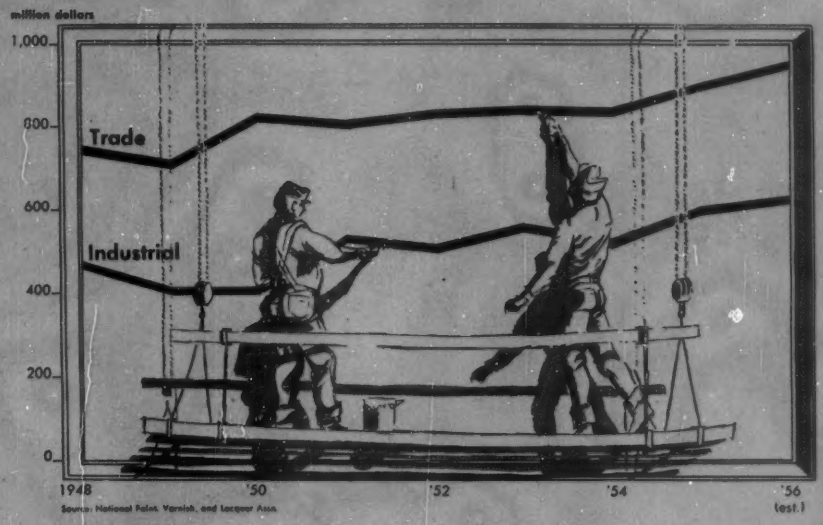
Charting Business

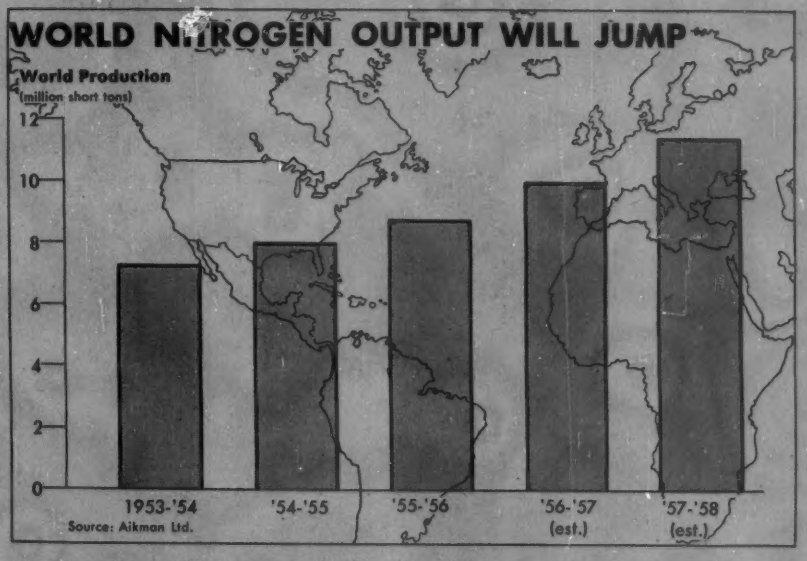
CHEMICAL WEEK
December 1, 1956

PAINTS SALES HIT A NEW MARK.



PAINT, varnish and lacquer sales will set a new record of $1.6 billion this year. Reasons: growth of the do-it-yourself house-painting and repair fad; new housing construction; reviving automobile production. About 60% of total sales of coatings is for repair and construction at home and in industry, while automobile and furniture outlets account for most of the remainder. Important changes in paint chemistry over the past few years that have contributed to the sales surge: use of more titanium dioxide pigment and more resin paint bases; development of water-thinned and rubber-based paints.

WORLD NITROGEN OUTPUT WILL JUMP

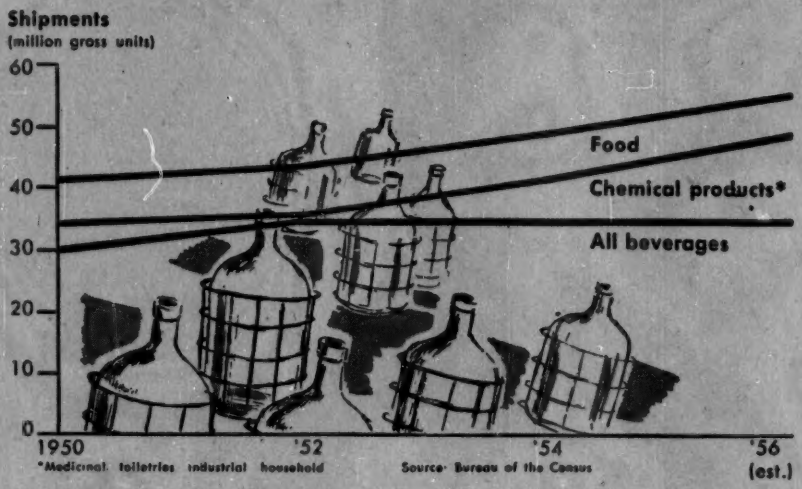


WITHIN two years, world production of nitrogen is slated to reach a rate of 11 million tons/year, nearly 2.25 million tons/year more than the estimate for '56. New plants are scheduled for construction in South America, India, South Africa, Italy, France, Spain and England (though in '58, as now, the U.S. will still be the leading nitrogen producer, trailed by West Germany and England). Result: with world production already outpacing consumption, it looks as if nitrogen surplus problems now plaguing U.S. sellers may well become global.

Charting Business

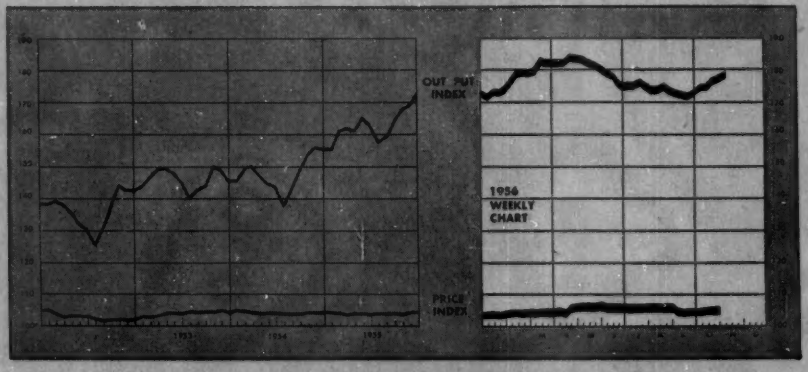
(Continued)

GLASS CONTAINER USE STILL GROWING... PACKAGING OF CHEMICAL PRODUCTS GAINS MOST



DOMESTIC SHIPMENTS of glass containers should hit an all-time high of 138 million gross (19.9 billion units) during '56. While food packaging is still the largest consumer (some 40%), chemical packaging is the fastest-growing use for glass containers, jumping nearly 40% since '50. Meanwhile, use of metal cans also continues to grow. This year, for instance, a record 40-billion-unit consumption of metal cans is anticipated by producers.

BUSINESS INDICATORS



WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	183.3	182.8	170.0
Chemical Week Wholesale Price Index (1947=100)	106.9	106.6	104.7
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	410.0	429.4	494.8

MONTHLY Trade (million dollars)	Manufacturers' Sales			Manufacturers' Inventories		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturing	27,691	27,632	27,224	50,082	49,535	44,703
Chemicals and allied products	2,011	2,094	2,010	3,714	3,618	3,188
Petroleum and coal products	2,531	2,572	2,346	3,157	3,065	2,787

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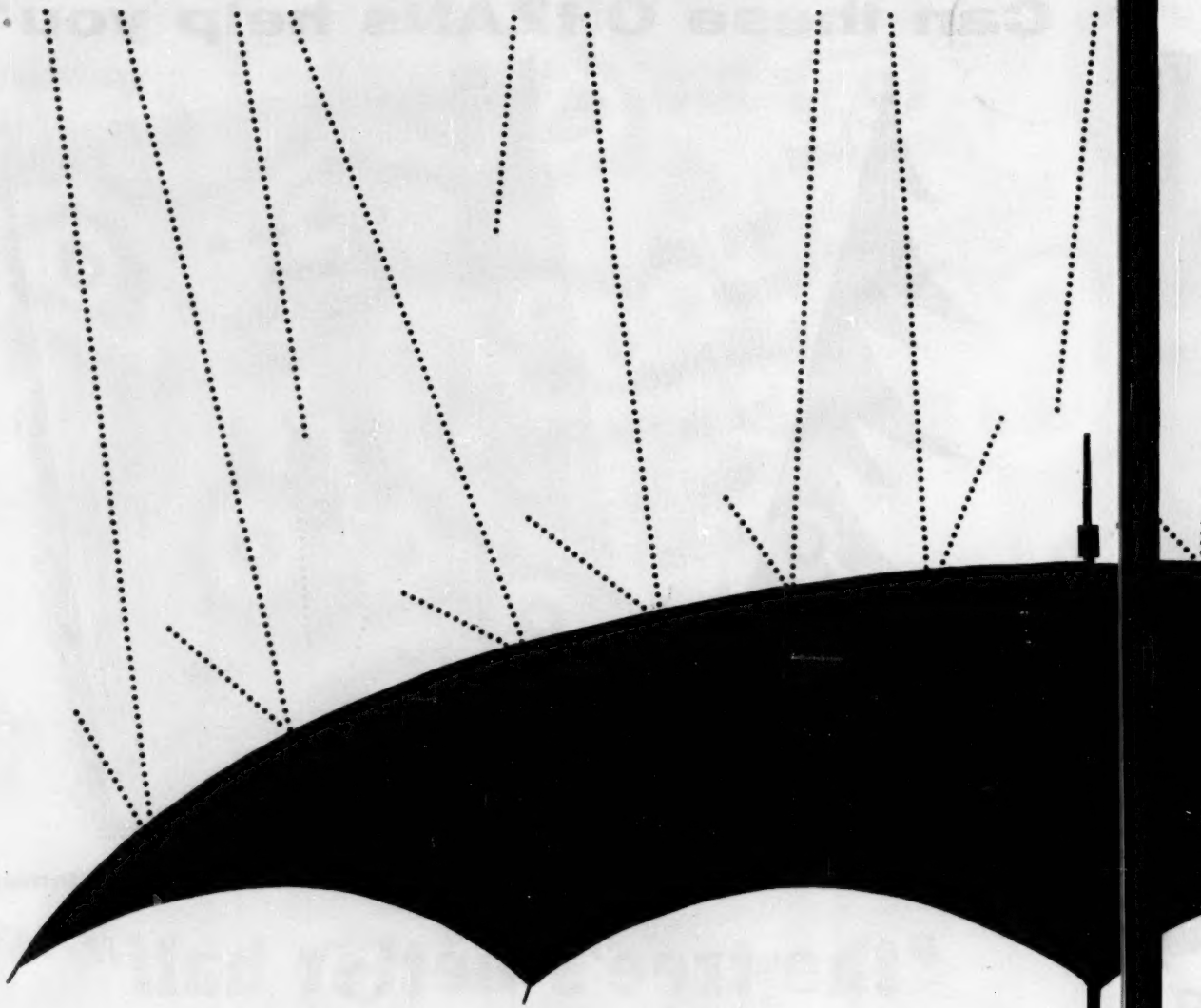

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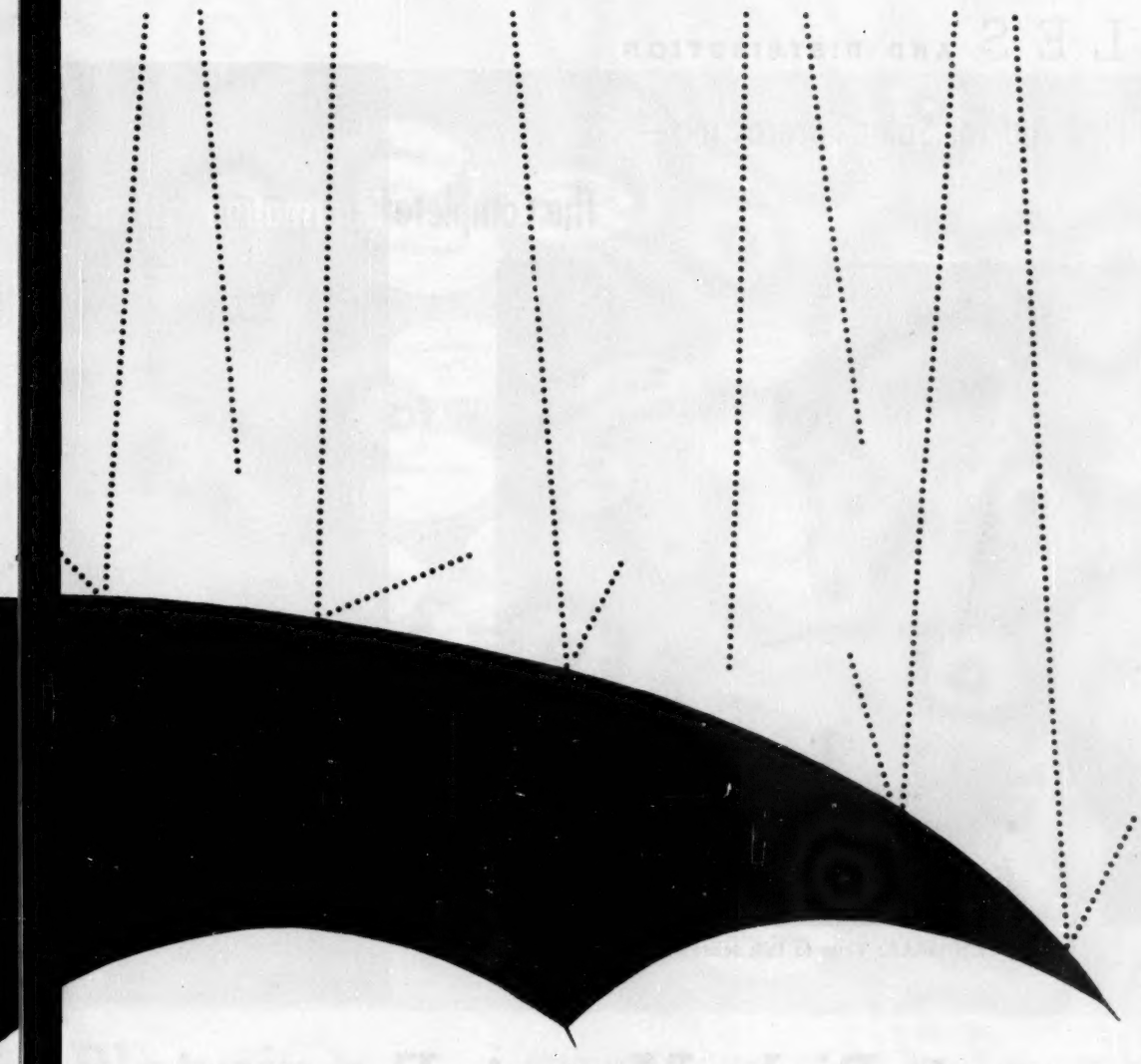

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CORNELL'S DALE: Time to talk sense on . . .

Forecasts: Risky Maps to Expansion

Expanding at an almost breathless pace, the chemical industry has had little apprehension about its future sales and profits. The pattern: forecast, expand, sell to meet the forecast. Recently, however, a shadow has been creeping across that successful pattern: 1956 ledger sheets point to booming sales and lagging profits (*CW, Nov. 10, p. 22*).

Is all well? CHEMICAL WEEK, in an exclusive interview, recently put that query to Ernest Dale, internationally respected consultant on marketing, accounting and top management organization, now serving as associate professor of business administration and economics at Cornell graduate school. Dale's opinion: forecasting in the chemical industry has some soft spots. It's time, he says, to "talk sense on sales forecasting"— from both the standpoint of forecasting technique and the marketing management needed to achieve the predictions.

Here are *CW*'s questions and Dale's replies:

Generally, what seems to be taking place, when you compare sales forecasts with results?

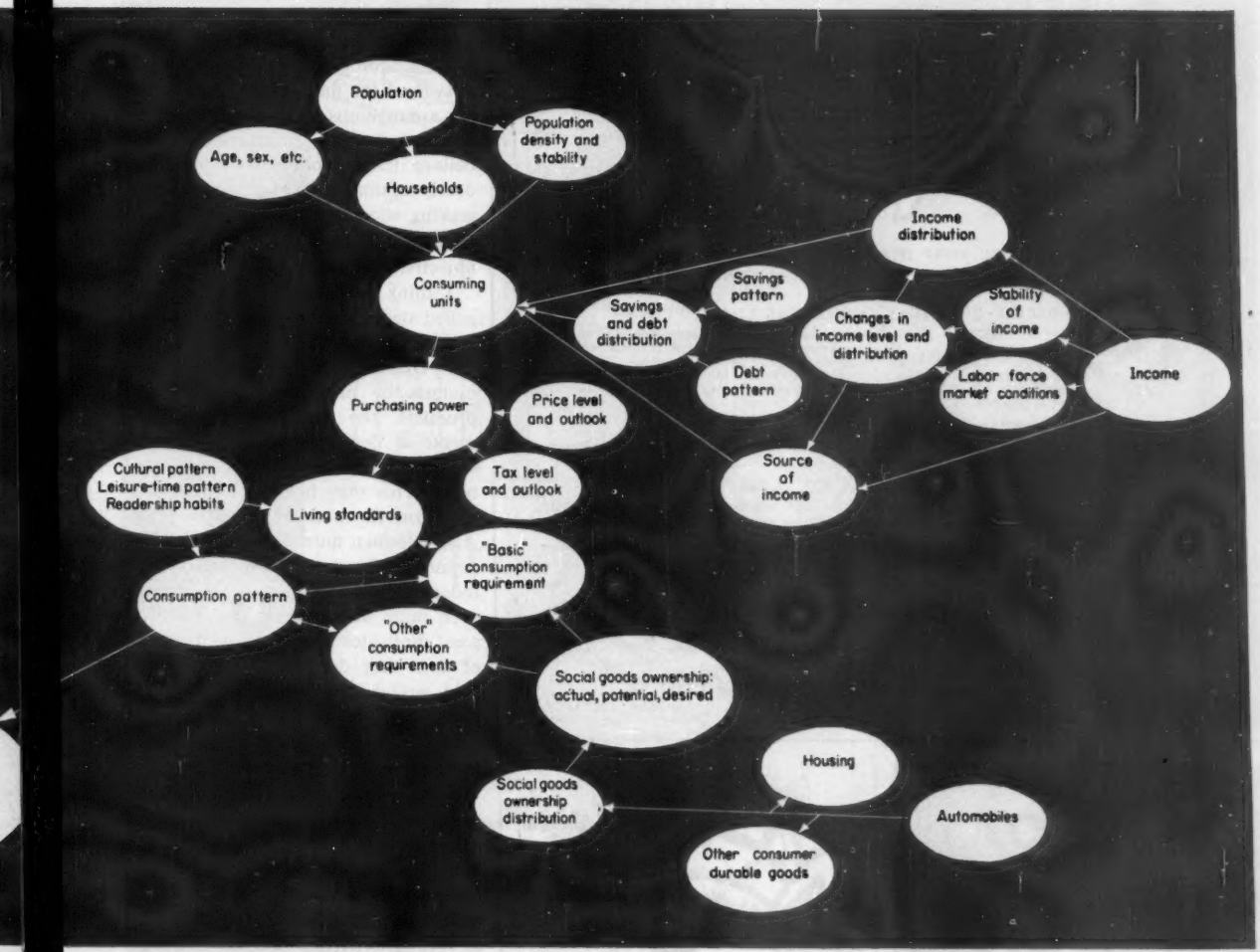
Companies have forecast increased sales and have built the plants to meet expected demand. Some forecasting has been predicated upon the assumption that industry will continue to grow at recent rates of expansion. If the rate of expansion slows down, and perhaps to some degree it has, some companies will be forced to pay for their expansion cut of sales that don't keep pace with forecasts. They may be forced to borrow funds to meet expansion commitments. In other cases, expansion by competitors has moved ahead faster than anticipated. This, of course, increases the output and competition for a given market and tends to drop price levels and increase selling expense. Nitrogen, I think, is one example of such overexpansion.

What is making sales forecasts inaccurate?

I think the trouble is basically in the forecasting technique itself and in the data that go into the forecast.

How would you describe the problem of poor forecasting methodology?

Chemical products eventually get into items sold to the consumer. Thus, chemical companies should get



Planning

into further market research on the consumer. Let's look at survey systems, for example. They tell only a partial story. Consumer opinions often change rapidly and tomorrow's opinions may contradict today's.

Are the more elaborate forecasting systems fallible, too?

Yes indeed. Some of the most comprehensive systems now in common use consider such diverse factors as population, population characteristics, income, income distribution, consuming units, consumer liabilities and assets, consumption patterns, to estimate total demand. But even these systems cannot tell whether a consumer will switch his purchasing intent. A small decline or commitment in income may produce a large decline in his discretionary purchasing power (i.e., expenditures beyond necessities and fixed payments). In fact, some consumer surveys have proved to be quite misleading.

How can you get more accurate forecasts?

You've got to use a complete information system* that relies, not on individual responses to produce a total demand, but rather on a total community response. This system will give insight into how and why the ultimate consumer feels as he does, why he will or will not buy. The heart of this approach isn't the survey. Rather, it's a continuing inventory reflecting the current status of all important factors (*see box*). Each major city or consumer area is continually analyzed to reveal income and purchasing power patterns, occupation and industry patterns, expenditure patterns of dominant income groups and traditional cultural motivations. From such data you can estimate aggregate attitudes that determine expenditure decisions.

*Developed in cooperation with R. S. Weinberg.

Could this system cope with a decline in purchasing power?

It may. It should show up in group response factors. The consumer will attempt to keep his relative position in the community. His buying is determined partly by his own opinions but mainly by the total response pattern of the group. Since the system measures just that, you get an accurate forecast.

What are the problems in industrial sales forecasts?

In the first place, salesmen tend to be overoptimistic or overpessimistic in their sales reports. Too, you have salesmen and sales managers—each with his own axe to grind—injecting their own bias into sales reports. This, I believe, may be done quite uncon-

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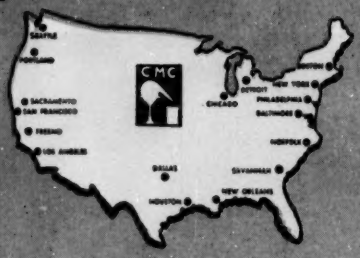

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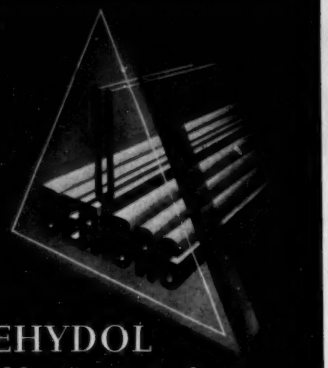

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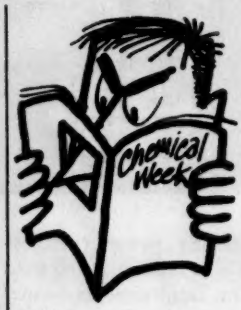

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SALES

sciously. Add to this the general expansion-minded atmosphere prevalent in many companies and their remoteness from the final consumer, and you get a dangerous situation. Some management has too much tendency to believe these reports and their own overly optimistic expectations without making allowance for inherent bias.

What can be done to improve the objectivity of sales reports?

I think we need more of the so-called operational type of call report. It calls for data showing, for example, the percentage of potential sales, and budgets by principal customers and products, the reasons for improvements or deterioration, the action to be taken, standardized for comparability. This may help to force objectivity on the part of the sales staff. And salesmen must be held highly accountable for the data turned in and independently checked. But perhaps even more important is research into what motivates people to give the kind of data they do give. Exploring this field would help us know what the element of bias is.

How can you guard against poor forecasts and overexpansion?

Fundamentally, you need a closer and more flexible tie between developments in the economy as a whole, the individual industry and the individual company on a varying volume basis: related to profits before and after taxes, this parametric approach will show, for example, that there is an optimum share of the market beyond which profits are likely to decline. That is to say, if the gross national product expands so many billions of dollars, how much are the industry and the company likely to expand? If the company's capital budget horizon expands, how much will be added to profits? Second, we need a much better application of input-output relationships. This will show where product demand and funds from industry come from and go to, and will permit much better forecasting. Third, there is comparative forecasting. You need to compare your plans with your competitor's expansion and rate of proposed expansion. If you don't 'beat the gun,' and you notice that everybody has the same ideas, you will be more cautious. Then, too, you'll need a better forecast based on better data and improved psychological insight about the final consumer. It may show, for ex-

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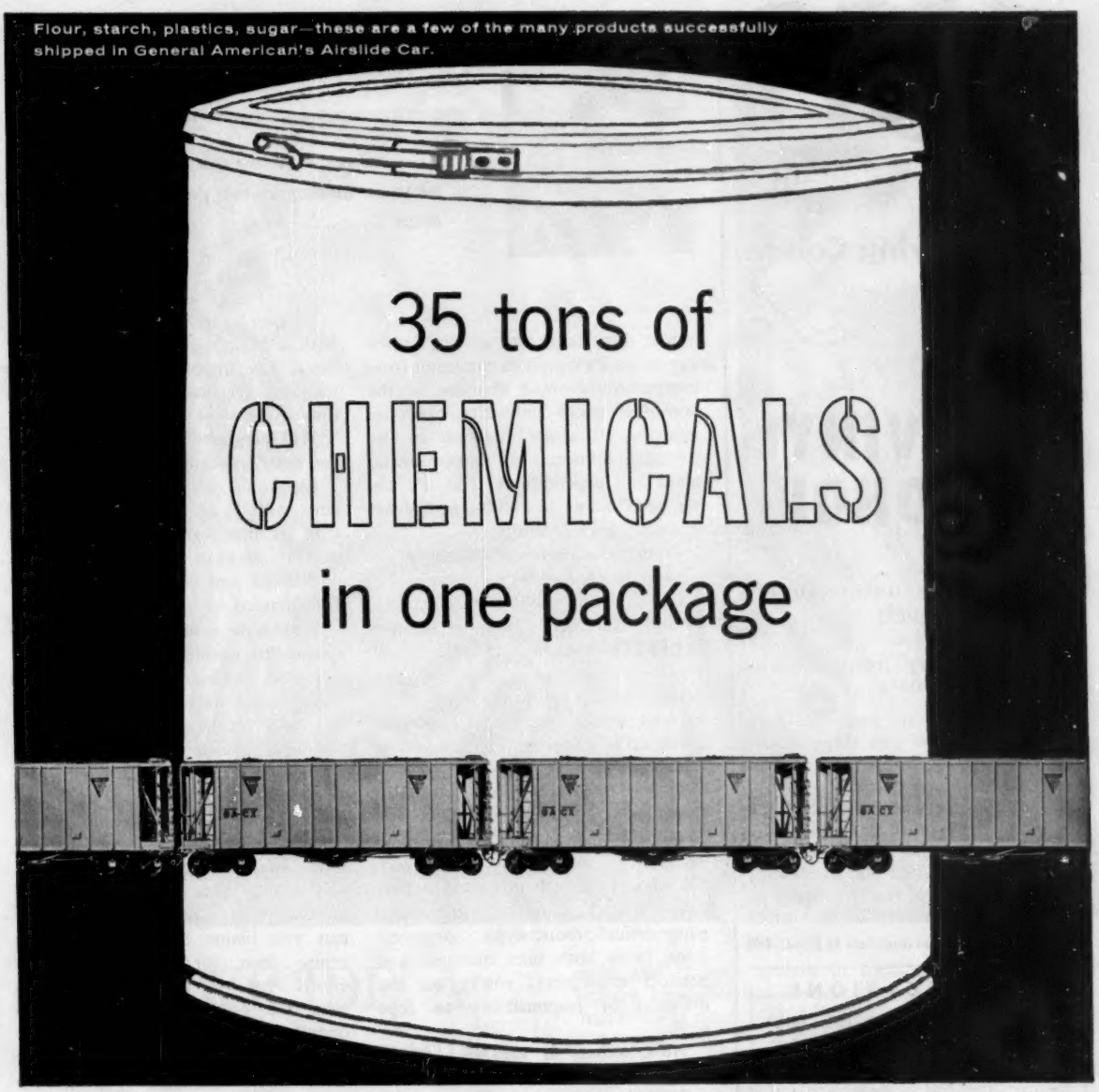

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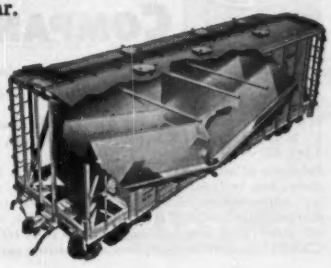

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'. . . sales results are often dreadfully slow in getting to the people who can use them . . . . .'

ample, how large fluctuations in the capital goods industries can result from comparatively small changes in the consumer goods industries. Such an analysis will draw attention to the strategic influence of governmental plans and expenditures. Too, I'd say we need better flexibility, or the art of hedging on commitments.

Hasn't the chemical industry's expansion been largely successful?

Oh yes. But even in this success, I think that there's been an element of luck. It takes a long time to put plants into production and, in prosperous times, companies can afford to wait several years to let demand catch up to capacity. Too, success in other areas often cancels out mistakes.

Is marketing hampered in fulfilling forecasts?

Indeed. Sales results are often dreadfully slow in getting to the people who can use them and then they may not be usable. In mixed geographical-product-type organizations (with both sales manager and product managers), you've got the diffusion of responsibility to cope with.

How serious is the sales results problem?

In some cases, there may be time lags of 3-4 months between the time the data are recorded and the time they reach managers. Sales managers should get their gross profit (or loss) statements no later than one month after the books are closed for the month. Weekly data is preferred.

What types of data are sales managers not getting quickly enough?

The operational breakdown of performance of subordinates is one example. That means the actual expense a salesman incurs compared with his sales volume, minus all expenses he is not responsible for. It's a productivity measure, hard, but not impossible, to get, and is very useful in pinpointing responsibility for results. Too, you've got to get the same information on both a regional basis and a product basis. It's important that the sales manager get these data while there's time to do something about trends.

Will integrated data processing solve the data processing problem?

Electronic computers and IDP systems will be of tremendous value if they are intelligently used, if input is properly planned, if pure extrapolation is avoided and if results are quickly disseminated to sales management.

What is the nature of the diffused-responsibility problem?

Let me illustrate. To avoid excessive travel, effort, and duplication in selling, and yet have the best possible technical assistance, chemical companies have been trending to geographical sales organization with field technical specialists. Obviously, you get the problem of how many men to have, how much to spend for them and where to have them. But even more difficult is this question: Whom can you blame or whom can you praise then for outstanding sales effort? And you have this complication: the product specialist is frequently the liaison between the plant and the salesman. This may make it difficult for the regional people to know what's going on in the plant and laboratories and to exert pressure on the plant. Yet if they did, the balance might be shifted too strongly away from production and technical services. This system may mean that salesmen's complaints and questions may get sidetracked in a maze of carbon copies. There may be a lack of coordination in getting the answers, and there may be really no one available to umpire and pass judgment on inadequate product performance. The salesman has to work through his product manager, who at this stage may lean too much to the technical side and may not adequately understand the customer's point of view.

Do you see any answer shaping up?

Frankly, I see this solution: gen-

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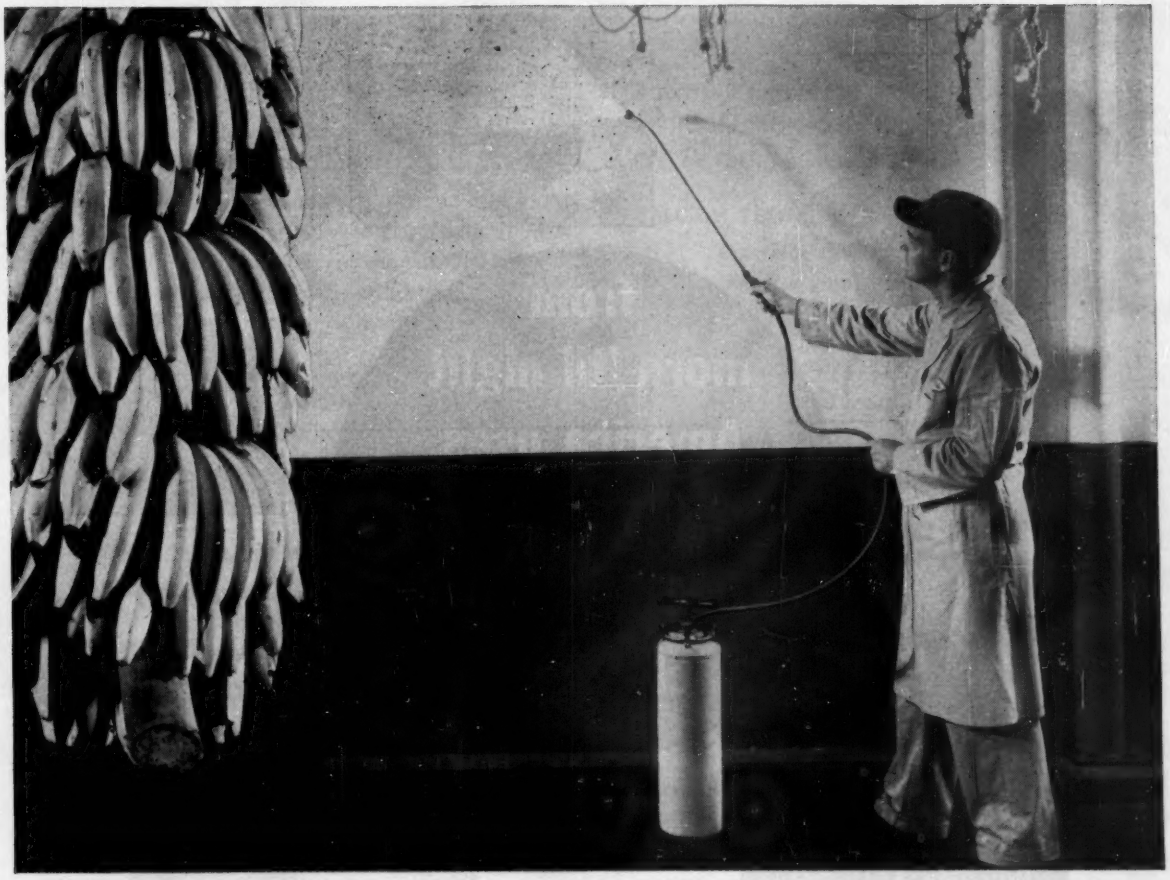

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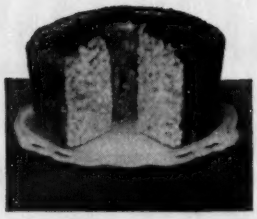

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Stauffer means service

Stauffer CHEMICALS SINCE 1885

'As the rate of product development slows, perhaps the industry will turn to improving marketing techniques to maintain profits.'

eral division managers must act very much more like owner-managers of their divisions. They've got to keep informed in a systematic way. The divisional manager can't just delegate everything and merely inspect final results without adequate follow-up. He must be more like a 'constitutional monarch, he must inform himself, he must challenge, he must counsel, he must involve himself much more deeply with the product until it's selling well.

Where does field management stand in this situation?

Some have become masters and victims of doubletalk. So many departments descend on them for information that their goals become contradictory; they have to tell one staff department this, another, that. It takes a lot of time away from their job. Moreover, all too often they don't have enough power. The regional manager must be the kingpin in representing the divisional managers and the company to the salesman and customer. They've got to get more authority if they are to handle their responsibilities intelligently.

Do you think that commercial chemical development must bear some responsibility for sales not meeting forecasts?

Yes—and in this respect: there's a tremendous time and financial gap between invention or product improvement, the pilot-plant stage, mass production and commercialization. The chemical industry is not as lead-time conscious as the automobile industry is, and companies at times don't keep very rigidly to schedules in bringing out a new product. There's a certain failure, I notice, to grasp the great difference between small-scale and large-scale production. It's in that area where salesmen are most handicapped —despite publicity, the chemical isn't there in sufficient quantity.

Just where would you say the trouble lies?

Well, there's a lack of urgency in research departments that's serious. Another thing: there may be a research bureaucracy with clearly marked out individual empires. And I'd say, too—with considerable emphasis—that you have many uncreative people and 'second-handers' who think themselves creative. They rely on others, they don't finish anything on time, and can't solve the big problems.

To solve their problems, are you thinking here of some type of coordinator?

I like the function, but not the title. First of all, you need much better forward planning; and second, much better organized liaison between research, development, manufacturing and sales and particularly less politics among these groups. The individual empires simply must be knocked together or knocked down. Some in top management are getting away from personally attending to involved commercial development delays. A specially appointed executive vice-president might help. Very small groups of those most intimately concerned should meet to thrash out the problems of delay, cost, quality. Somebody or something must generate pressure. I'd also say that you need to separate 'thinker-uppers' from 'getter-doners' and to remove some of the administrative burdens from creative research and development people.

Does pressure necessarily have to come from management or outside circles?

To a certain extent, yes. But management can do a great deal by just setting the right climate. The 'climate' is simply the result of the attitude of the leaders, and it can be a great inspiration. It's amazing to what heights people can rise without being told what to do, and without specific pressure, when they're informed of a situation or problem and told that it's for them to find the answer. For men will tend to act as their leaders do.

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CMRA MEMBERS* at Harvard session. For their work, they received . . .

Bricks, Bouquets at Boston

"The present financial thinking of both business and government is more out of date on the eve of 1957's new inflationary crisis than the claims of the Suez Canal Co.," according to Eliot Janeway, president of Janeway Publishing and Research Corp. Taking the stand that it doesn't take acute observation to be right where economists are wrong, Janeway cautioned attendees at last fortnight's Chemical Market Research Assn. meeting at Harvard to "give top priority to the foreign crisis as the trend-making factor it is—much more so than the familiar statistics and clichés that still dominate most business forecasting."

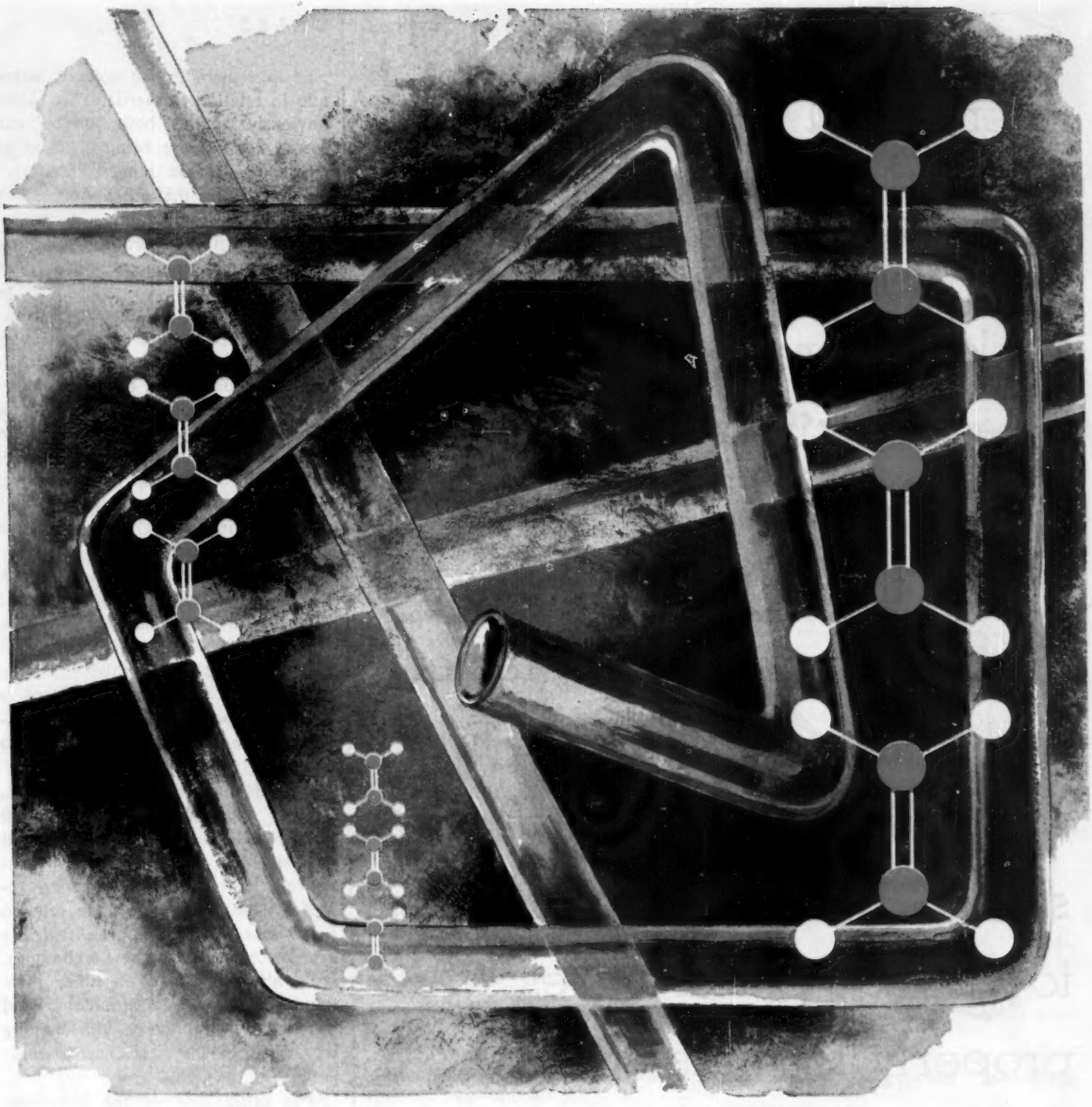
"It is a new inflationary crisis here that the political and military crisis abroad is forcing upon us," he said. "Pre-crisis business thinking has regarded cash as more valuable than goods and facilities. But the headlines of the last month are once again making inventories and equipment more valuable than cash. For more than a year, business has wanted to be a seller. But now the new crisis abroad is forcing business to turn buyer again."

Blasting as obsolete the concept that prosperity goes with tight money, and that it takes a slump to make money easy, he painted this picture of 1957: "The demand for money will be greater than ever before—and greater than anyone can now budget or even anticipate. Nevertheless, to the surprise of the business community, money will be made cheaper, and it will be easier—not for everyone, but for those qualified to borrow it for emergency purposes, beginning with the government itself. The government will be even more surprised than business when it finds itself making money easier and cheaper—instead of tighter and more expensive—amidst a panic increase in the demand for it."

Motivation Scan: Over-all theme of the meeting was new market research tools. One that's growing fast in popularity is motivation research, which was characterized by Burleigh B. Gardner, executive director of Social Research Inc., as "a step along the road to understanding and predicting behavior in the marketplace, a way of determining what the forces are that are working under the skin." While he stoutly defended motivation research, he said there is a tendency to emphasize techniques rather than the data procured through those techniques.

In evaluating what makes a person act the way he does, accept or not accept the conclusions of his own findings, Gardner believes it's impor-

*Left to right: Kenneth King Jr., Pennsalt; Harold L. Ward, Corn Products; and R. J. Eastman, Pennsalt.



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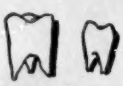
WAX can improve virtually every product of industry—whether it is used in the pantry, or the parlor . . . for beauty or pleasure . . . in the sciences (medicine and  dentistry), and in the arts . . . in the mine, in the factory and in the office. From ship launchings to shoes . . . from electronics to egg preservatives, WAX, properly formulated, offers a host of product improvements and production economies.

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tant to remember the role of status quo in relation to inertia. This factor obviously applies both to the one whose motives are being checked as well as to the one doing the testing.

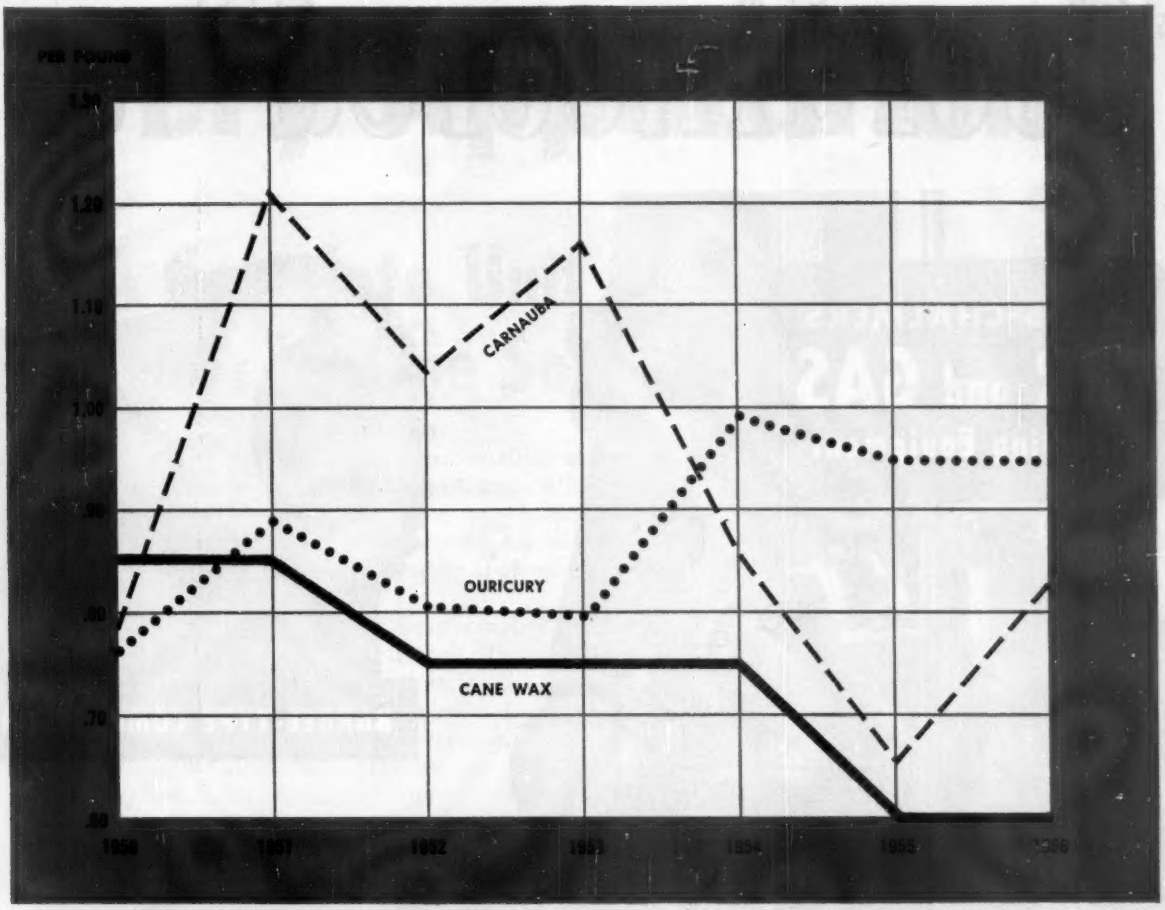
Anticipating the question "Doesn't motivation research concern the housewife and not the scientist?" Gardner asserted that engineers have their biases and attitudes—which tend to creep into their calculations on occasion. Having these failings, being subject to the same processes that affect the housewife, it becomes important, said Gardner, to establish a good image of your company in the mind of your customers. This image, fostered by such means as institutional advertising, is one of the factors that can create the right emotional climate in which to introduce a product.

The subject of motivation research has even aroused a good deal of partisan reaction. Said one CMRA member to *CW*: Harvard has a real case of schizophrenia today. While one part, the undergraduate school, is trying to wipe out man's bias and prejudice, here we sit learning how to exploit it."

Techniques—Pro and Con: Neil H. Borden, professor of advertising at Harvard Business School, cautioned against going overboard for new, unproved techniques of marketing research, said it's important to rely on horse sense. "Business," he said, "is ever reaching out for new techniques, is learning a lot from the other disciplines—sociology, anthropology, and psychology—but, we're still a long way from having a science of marketing."

The other side of the coin was presented by Claude Robinson, president of Opinion Research: "Horse sense is important, but let's tolerate some screwballs; they may have the kernels of some good ideas." He also asserted that some people won't accept new ideas and techniques, are inclined to stick to the status quo because it is associated with status. Some people, he said, feel uncomfortable with change because it affects them personally.

In all, the CMRA members, with eight speakers tossing ideas at them at the one-day session, may well have gone home feeling that if they can't yet consider their work a science, they are at least well along the right path to that goal.



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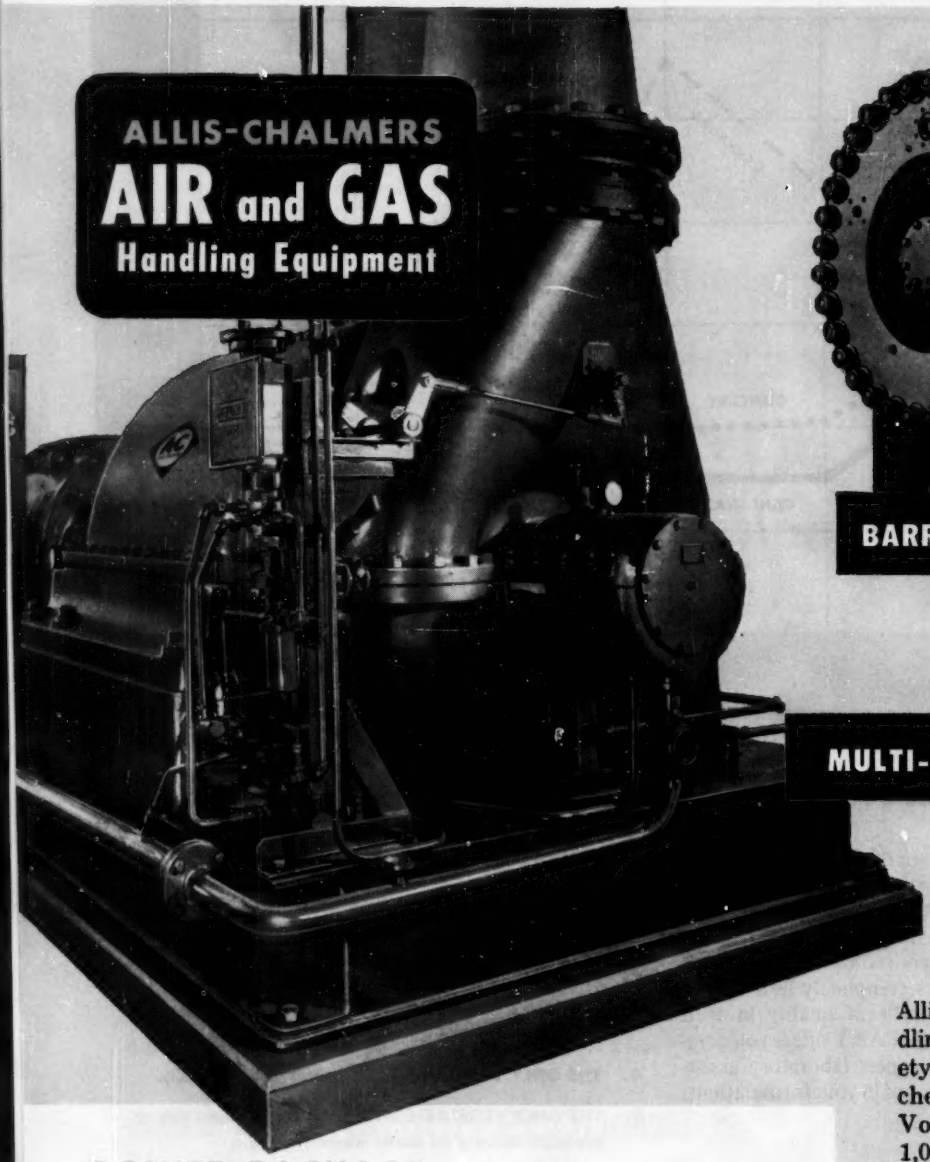

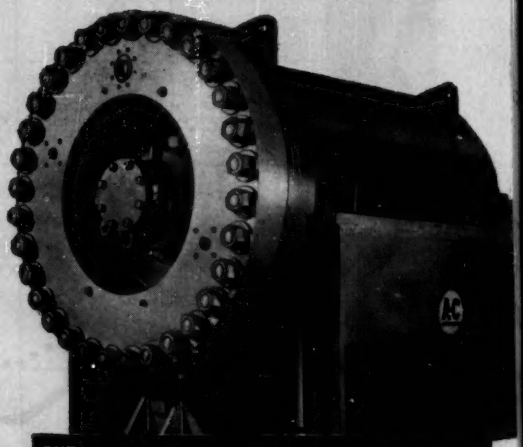

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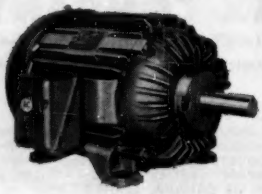

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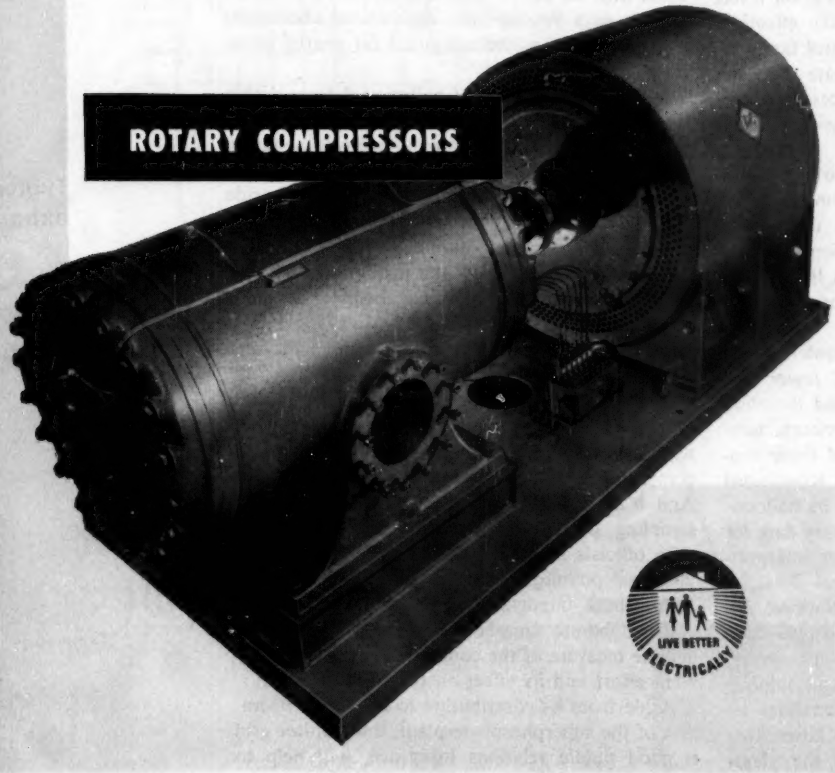

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Monitor Grid: Phosphate Plant's

MEASURING pollutants from a chemical plant can be almost as big a job as eliminating them. Case in point: American Cyanamid's abuilding triple superphosphate plant at Brewster, Fla., which will use an elaborate sampling network and system for checking pollution. Though production isn't scheduled to begin until mid-'57, a 5-year study of air and water pollution in the Brewster area is already under way.

Front line of Cyanamid's pollution defense perimeter is a series of air- and water-monitoring outposts (*see map*) manned by sensitive automatic sampling devices. The special monitoring equipment was devised by the company's industrial hygiene department, under the direction of William Bradley. Selection of the sampling station sites was based on a knowledge of prevailing weather conditions in the area, calculated stack-emission patterns.

Twofold Aim: First job of the elaborate sampling system will be to determine just what contaminants are in the air and water at the present time. Such a record of "normal" pollution levels will provide a basis for measuring the effectiveness of the new plant's pollution control facilities, will enable Cyanamid to differentiate between contamination from its own dry-processing operations and those originating at the several other phosphate plants in the vicinity.

The system's second job will be to serve as a double check on the pollution abatement equipment (gas scrubbers, water-treating units, etc.) that are being built into the plant. Sensitivity of the instruments is great enough, says Bradley, to detect an operating failure long before pollution can build up to a hazardous level.

Keystone of the pollution defense system is the company's weather station (*see cut, lower left, p. 61*), which constantly records wind direction and velocity, humidity, barometric pressure, temperature and rainfall. Measurement of these conditions both at ground level and aloft (conditions at 300- and 600-ft. levels are obtained by balloon-borne instruments) provides the necessary data for calculating stack emission patterns, for interpreting results of air- and water-sampling.

Air samples are collected at four stations. An automatic device pulls air first through a glass-fiber filter, then through two selective scrubbing agents, which successively remove fluorides and sulphur dioxide. In addition to colorimetric analyses to determine the concentration of the latter two contaminants, substances trapped by the glass-fiber filter are dissolved and checked by pH measurement to determine sulfuric acid mist that might be present in the air.

The normal solids content of the air is checked by eight dustfall collection stations—one atop each of the air-sampling units plus four others at sites a mile from the plant. Dustfall samples are collected monthly, analyzed to determine total solids, water-soluble solids and fluorides in the air.

At present, the only stream-sampling station in operation is the one downstream from the ditch that receives the plant's effluent on the south prong of the Alafia River. Two others—one upstream from the ditch, one close to the plant's disposal facilities—will be added before the plant goes in operation. Each of these stations will collect 20-ml. samples at 15-minute intervals, storing them in plastic containers for weekly collection. Water is analyzed for both pH and contained fluorides.

Aside from the automatic sampling stations, Cyanamid will employ an agricultural plot, planted with pollution-sensitive fruits, vegetables and flowers, as a double-check on its control system. Because of the extreme sensitivity of certain plants (some show visible signs of damage on exposure to as little as 0.3-0.5 ppm. of air-borne contaminants), says Bradley, the agricultural checkpoint will provide an added safeguard for nearby citrus crops.

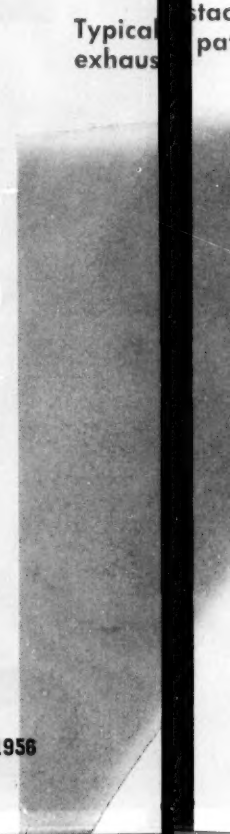
In-Plant Control: Chief pollution defense within the plant itself: a battery of specially constructed scrubbers, waste water treatment and settling tanks, and a 200-ft.-high stack. The neoprene rubber-lined scrubbers have been designed to limit fluoride and sulfur dioxide concentrations (Cyanamid is shooting for complete elimination of these contaminants) to well below the maximum tolerance levels within the plant.* Except for these auxiliary facilities, the dry-processing of triple superphosphate will employ conventional equipment and production practices.

A public demonstration of Cyanamid's pollution preparedness has already gone a long way to allay local residents' fears that the new plant would compound pollution problems around Brewster. And it's likely that the data compiled from the sampling program will be a helpful guide to state officials in setting up legislation to regulate industrial pollution.

But most important — to Cyanamid, at least —the elaborate sampling network will provide a definite measure of the company's pollution abatement effort and its effect on the Brewster area.

Aside from its contribution to the direct operation of the superphosphate plant, the monitor grid is good public relations insurance, will help to refute unfounded accusations of pollution guilt.

*Maximum tolerance levels inside plants (based on an 8-hour work day) are considered to be 2.5 mg. of fluorides/cubic meter of air, 10 ppm. of sulfur dioxide. These permissible concentrations include a 10-fold safety factor.



Pound of Pollution Prevention

Water-sampling station

TOWN OF BREWSTER, FLA.

Prevailing Wind

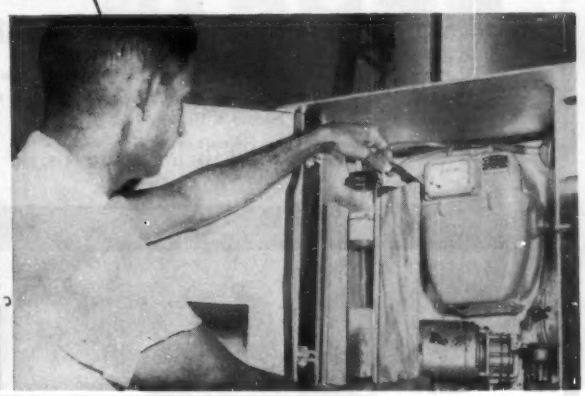
Dry-processing plant

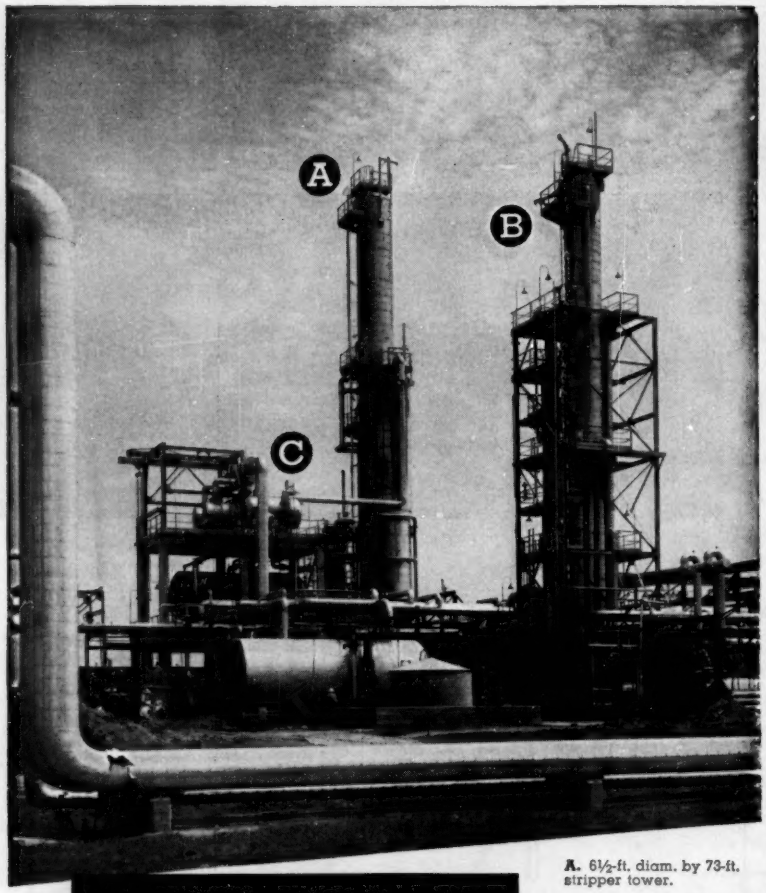
1000 yards

½ mile

1 mile

Air-sampling stations





A. 6½-ft. diam. by 73-ft. stripper tower.

B. 5½-ft. diam. by 88½-ft. absorber tower.

C. 6½-ft. diam. by 20-ft. accumulator tank.

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PRODUCTION

PROCESSES

Soda Process: Coosa River Newsprint Co. (Coosa Pines, Ala.) is readying the first commercial installation to produce newsprint pulp by Forest Product Laboratory's (Madison, Wis.) new cold soda process. Said to be cheaper than other hardwood processes, cold soda pulping costs about 10% more than the groundwood process, a mechanical pulping used for softwoods (groundwood pulp is generally blended with sulfite pulp for newsprint).

The cold soda process combines features of mechanical and alkaline pulping. Hardwood chips are first softened by a cold caustic soda solution (alkalis of the concentration used in ordinary alkaline cooking are known to dissolve an appreciable amount of wood at room temperature), then reduced to fibers in a disc mill. Process losses run about 10%, are considerably lower than losses by cooking, and not much higher than groundwood process losses (5%).

•

Heat Transfer: The Metal Division of Imperial Chemical Industries, Ltd. (England), has come up with a process that joins two aluminum sheets without local welding or brazing, forms a tube with external fins to give a large heat-transfer area. The tube pattern is silk-screened onto one sheet using a special ink. The second sheet is placed against the printed side of the first sheet; cold-rolling welds the two sheets together at all points except where the ink is present. Annealing recrystallizes the metal structure, gives a full-strength weld, vaporizes the ink on unwelded portions. Then, a high-pressure inflation step forms the tube.

•

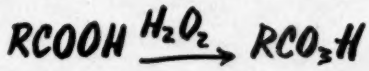
Water Desalting: A pilot plant for removing salt from brackish water by freezing will be built by the Israel Ministry of Development at a site on the Mediterranean. Developed by Israeli researcher, Alexander Zarchin, the process will use water vapor at low temperature and under vacuum as the refrigerant. A special arrangement of heat exchangers is said to give high thermal efficiency—stumbling block of most freeze-desalting units. It is estimated that conversion of one cubic meter of water will require a power input of about 3 kwh.

You Get a Fast Start in a Wide Range of Organic Reactions with Albone®

hydrogen peroxide

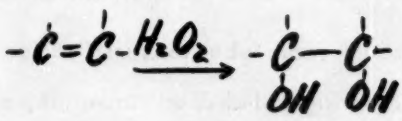
When properly activated, "Albone" hydrogen peroxide is a highly effective oxidizing agent for organic synthesis. Here are a few examples of the possible uses for Du Pont hydrogen peroxide in organic reactions:

Peracid Formation. When hydrogen peroxide is activated by forming a peracid, its reactions are often faster—yields are often higher.



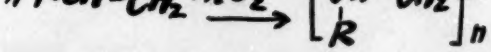
Detailed information on preformation of peracetic acid is available from Du Pont.

Hydroxylation. Olefins are converted to glycols by hydrogen peroxide although epoxides and derivatives may be formed first in the reactions.



Long-chain glycols and derivatives have value as plasticizers and modifiers in coatings, rubber, plastics and emulsifiers.

Polymerization. Hydrogen peroxide, usually employed in emulsion techniques, initiates the polymerization of a variety of unsaturated monomers.

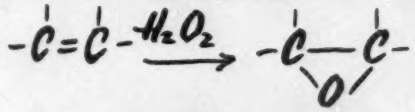


The polymers formed have been useful as rubber substitutes, adhesives, plastics and coatings.

Nitrogen Oxidation. Tertiary amines are oxidized smoothly to nitrogen oxides in the following reaction:

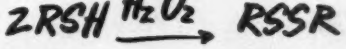
N-oxides are useful as therapeutic agents.

Epoxidation. The epoxidation reaction has simplified the conversion of fatty oils and derivatives into useful and profitable products.



Epoxides are useful as plasticizers, stabilizers, insecticides and drugs . . . have many possibilities as lubricants, coating constituents and chemical intermediates. Du Pont has developed several efficient procedures for epoxidation. Complete information on these procedures is readily obtained in a booklet available from Du Pont.

Sulfur Oxidation, Quinone Formation and Ketone Cleavage are other examples of propitious use of hydrogen peroxide in organic syntheses.



Certain sulfur oxidation products have shown antimicrobial activity. Suggested uses for the products of sulfur oxidation have included fungicides, insecticides and rubber accelerators.

Du Pont's long experience in the manufacture and use of "Albone" can help you in developing potential applications for Hydrogen Peroxide. Call or write: E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

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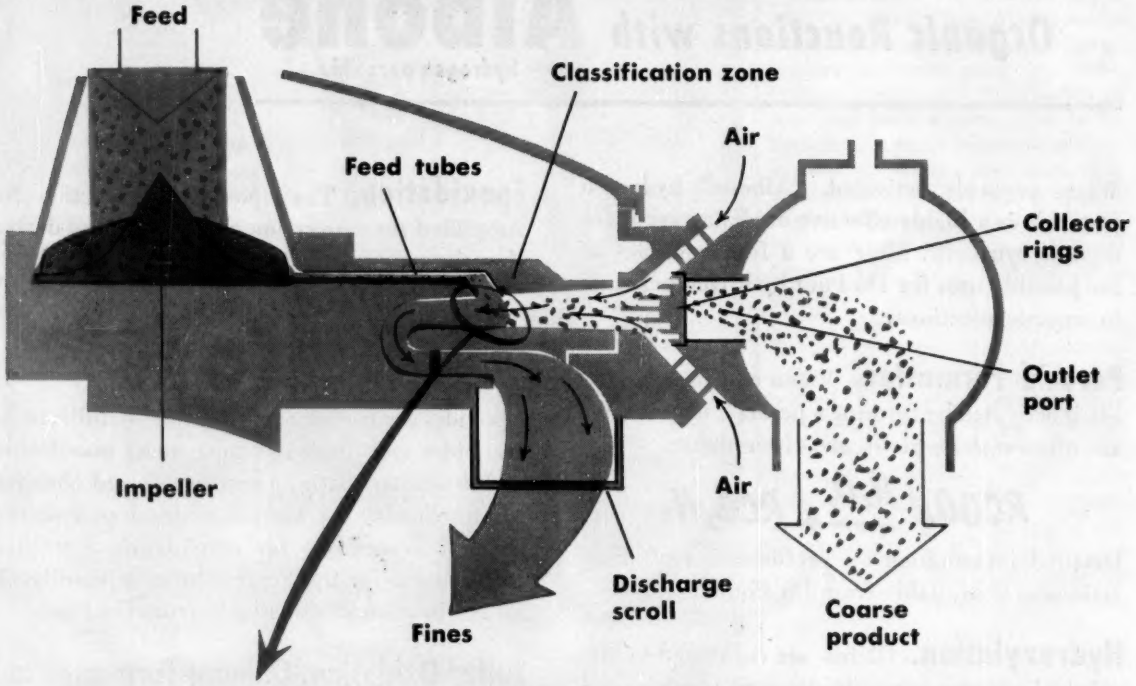
New classifier gives sharper cuts of micron sizes.



Key: uniform force field in the classification zone.

Feed material is distributed by rotating **impeller,** flows through **feed tubes** to **classification zone.**

Coarse product is thrown by centrifugal force into **collector rings,** which direct it to **outlet port.**

Fines are swept out through **discharge scroll** by **air** entering through inlet vanes.

The Trick Is in the Spin

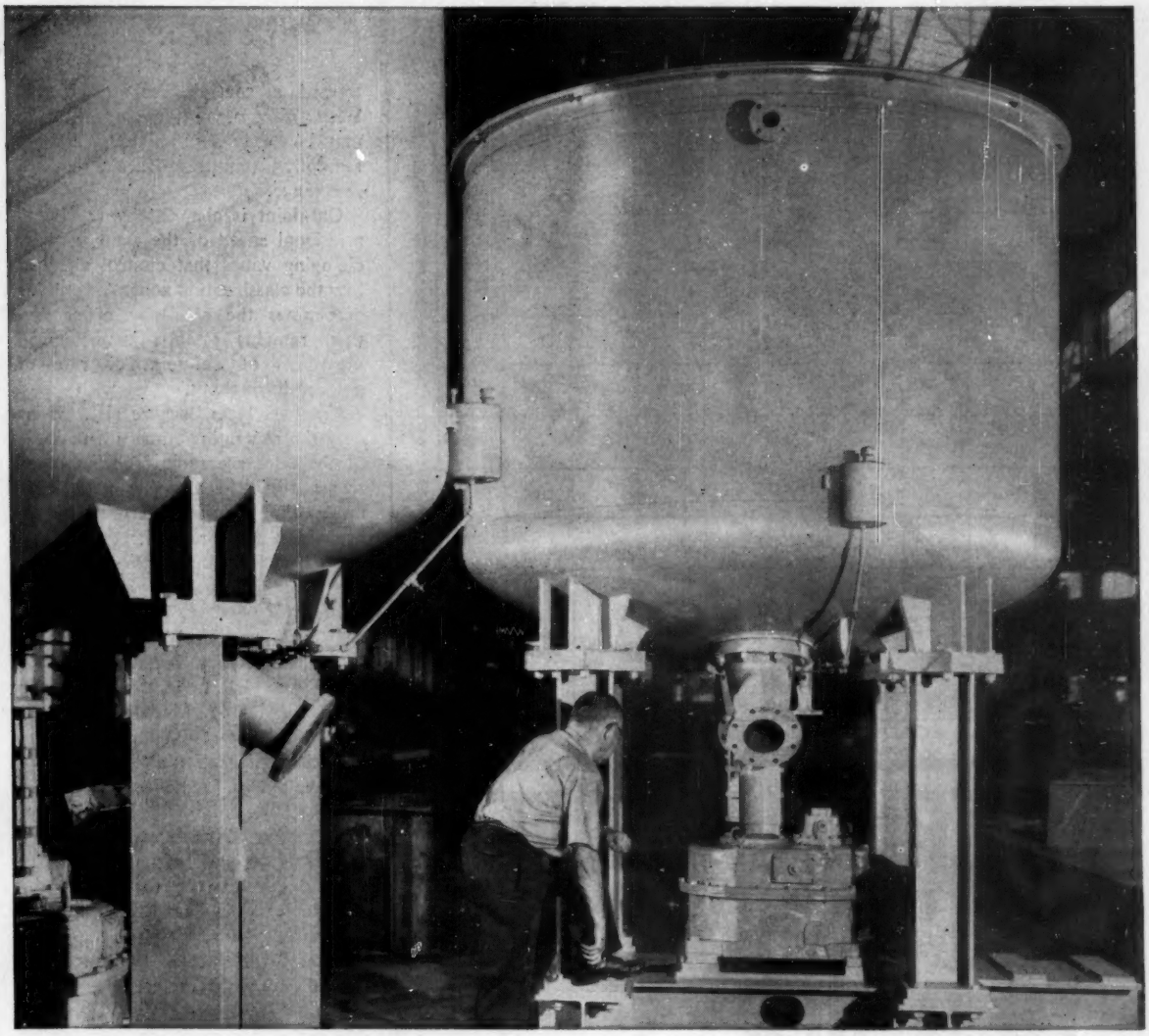
The Sharples Corp. (Philadelphia) is taking the wraps off a new type of air-vortex powder classifier—its highly touted Super Classifier (CW Technology Newsletter, Nov. 24). Claiming advantages of high capacity, high efficiency and ultrasharp separation of micron-size powders, the firm has already sold the new unit for two or three conventional applications and a couple of new uses that are under security restrictions.

The basic principle of dry-particle separation hasn't changed, says Sharples' research director, Robert Payne, since the Egyptians discovered that air would separate the chaff from heavier-grain particles of falling wheat. As engineers converted the ancient art into a modern science, centrifugal force was substituted for gravity, forced air draft replaced wind. But the key to making the operation efficient lies in how these forces are applied.

Up to Speed: To eliminate the air-drag losses that occur when solid particles are brought up to rotational speed by a swirling stream of air, Sharples devised a novel method of imparting the necessary velocity before the powder is introduced into the classification zone. Trick: multiple feed slots that carry the powder out to the periphery of a spinning rotor before it's dropped into an air stream.

The advantage of getting the powdered feed up to speed, says Payne, is that the only forces acting in the classification zone are centrifugal force (pulling the large particles outward) and air drag (pulling fines in

TEST RUN: In balanced separating forces, a new twist.



We took a new look at Dissolvers

The problem was to increase productivity per machine hour. The process in which the dissolvers were to be used involved a slowly soluble, dough-like material which had to be held at comparatively low temperature.

Working with the customer's process engineers, design requirements for increased production were developed. The equipment would have to be larger than any previously used, and also capable of utilizing more power efficiently. This was accomplished by designing an 1800 gallon dissolver with an impeller that had high shearing action. Relatively high power, used effectively, reduced the particle size, and production per machine was more than doubled.

The solution of this problem exercised Dravo's unusual talents in the design of special purpose and large scale equipment, and called for an engineering approach unhampered by production line restrictions. If your operation could profit by the use of high energy intensive dissolvers, or other equipment designed to increase the speed and efficiency of process operations, call on Dravo. Write for Bulletin 236 for more information on Dravo Process Equipment. Address Dravo Corporation, Pittsburgh 25, Pa.

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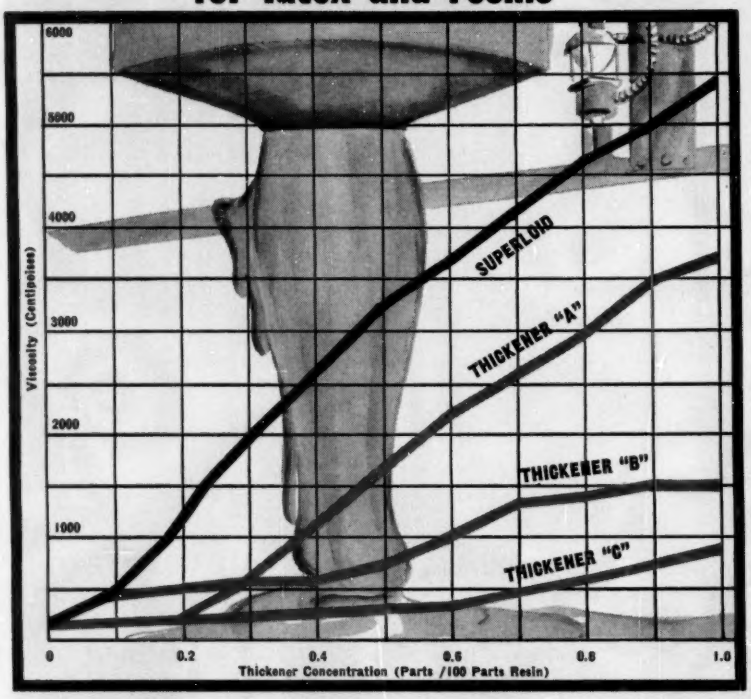
Never before so efficient a thickener for latex and resins



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This remarkably effective thickening agent produces desirable body and substantially improves working properties of latex and resin preparations. A highly efficient binder and stabilizer, Superloid prevents water separation and holds filler ingredients in improved suspensions. Especially effective for maintaining stability of dilute latex systems!

Easy to use, Superloid aids film formation and improves spreading characteristics. Provides viscosity control to meet precise penetration requirements. It reduces impregnation, prevents shrinkage patterns in thin coatings and films.

Superloid measurably improves processing in such diverse applications as: bodying of resin and latex adhesives for better working properties and improved spread; conditioning of latex for fabric backing applications; imparting desirable body and workability to latices for paper and textile sizings and coatings; and in other latex and resin applications for thickening, bodying, stabilizing, bonding and suspending.

If your latex or resin process or processing requires a thickening agent and stabilizer, Superloid may well test most efficient for your application.

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toward a central discharge scroll). With this system, the force balance may be easily adjusted to give sharp separations (cut-points) at the required size range.

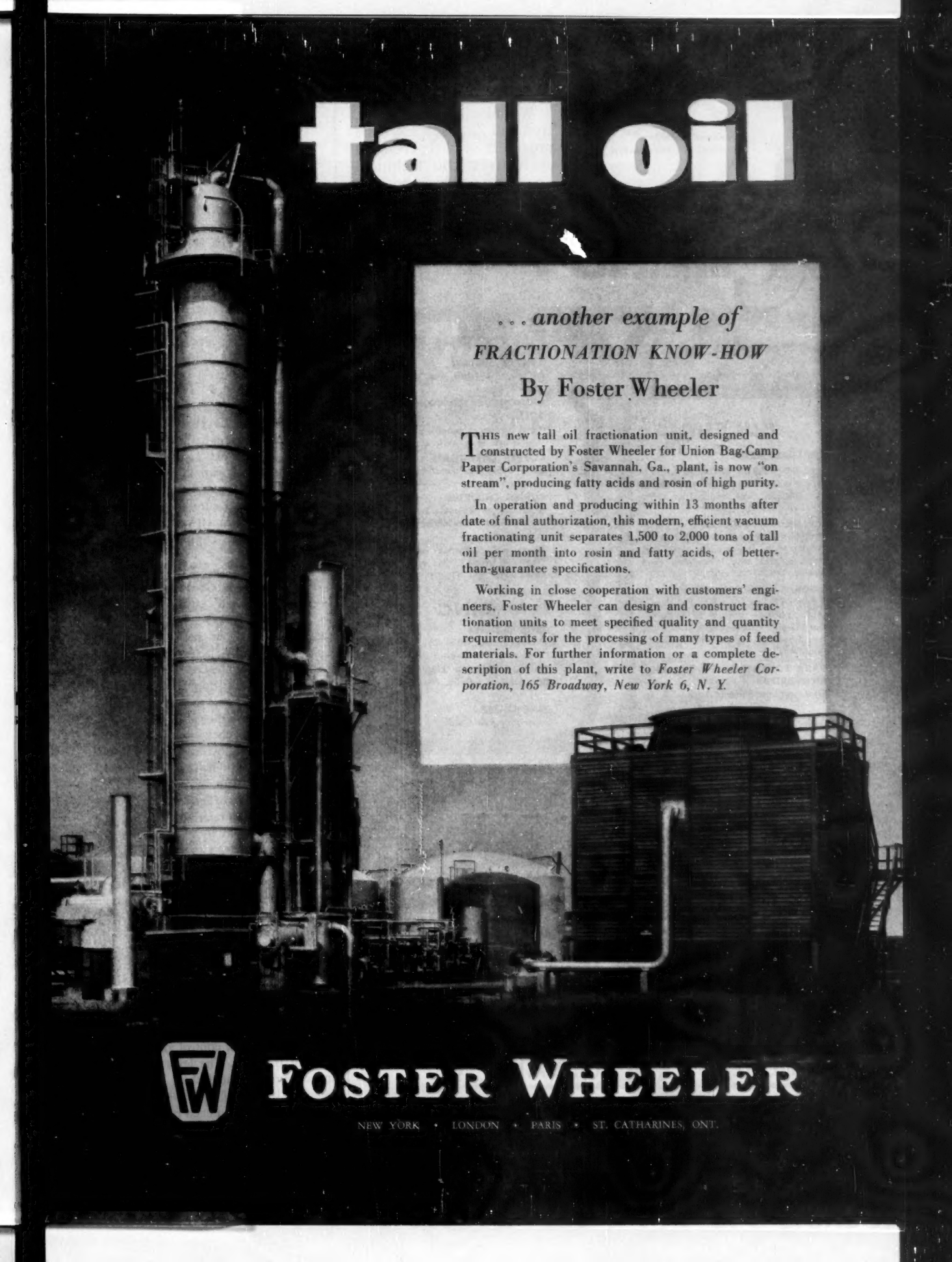
Cut-point is changed by regulating rotational speed of the rotor, and by changing vanes that control air flow into the classification zone. Air volume determines the efficiency of separation, remains essentially unchanged regardless of cut-point or rate of powder throughput.

Compact Size: Because air supplies only the separating force, up to 90% of the fines are removed from oversize product in a single pass. This means that less product must be recycled to the size-reduction equipment, that the entire grinding-classifying system may be operated at a higher throughput capacity. The Super Classifier itself provides capacities from 1,000 to 3,000 lbs./hour (for the 16-in. K-16 model) to 15 tons/hour (for the 34-in. K-34). Models are priced from $10,000 to $40,000.

Rapid classification also reduces the time the material remains in the classifier, thereby minimizing wear of internal parts by abrasive materials. Too, the restricted classification zone limits most of such wear to the coarse-particle collector rings, which may be hard-surfaced and which are easy to replace. Feed slots in the rotor are also fitted with replaceable, wear-resistant liners.

Sharples has made production-size runs with a variety of materials ranging from aluminum oxide to zinc sulfide, reports that flour millers and glass producers have obtained results that were unattainable with previous classifiers. Other likely targets: pigment producers, ore processors, plastics manufacturers (Sharples reports that many companies have shown interest in the Super Classifier for sizing polyvinyl chloride powders in the 15- to 100-micron range).

New Field: The commercial debut of the Super Classifier, says Sharples, marks only the first of the company's ventures into dry processing. This departure from the firm's traditional specialization in centrifugal machines for liquid-liquid and solid-liquid separation has been in the works for more than 10 years. The encouraging results of this initial venture bodes further incursions into dry processing.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. . . another example of
FRACTIONATION KNOW-HOW
By Foster Wheeler
THIS new tall oil fractionation unit, designed and constructed by Foster Wheeler for Union Bag-Camp Paper Corporation's Savannah, Ga., plant, is now "on stream", producing fatty acids and rosin of high purity.
In operation and producing within 13 months after date of final authorization, this modern, efficient vacuum fractionating unit separates 1,500 to 2,000 tons of tall oil per month into rosin and fatty acids, of better-than-guarantee specifications.
Working in close cooperation with customers' engineers, Foster Wheeler can design and construct fractionation units to meet specified quality and quantity requirements for the processing of many types of feed materials. For further information or a complete description of this plant, write to Foster Wheeler Corporation, 165 Broadway, New York 6, N. Y.
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LIQUID SULFUR DIOXIDE
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Industrial Crystals and all common grades.

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35% Copper as metallic packaged in steel drums at no extra cost.

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Monohydrated, 36% Zinc as metallic. White, free flowing powder.

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Secondary Zinc Oxide.

Samples, specifications and detailed information upon request.

TENNESSEE CORPORATION

617-629 Grant Building, Atlanta, Georgia

EQUIPMENT

Welding Electrode: Metal & Thermit Corp. (New York) has come up with a new iron-powder welding electrode that is claimed to aid in directing and controlling the deposit. Key: it's said to yield a more stable arc, maintain the protective shielding as the electrode is consumed. Called Murex Speedex R, it is the first iron powder in the AWS E-6010 class, according to M & T; it's recommended for welding galvanized plates, steel castings, pipelines, tanks, fired and unfired pressure vessels, many low-alloy, high-tensile steels up to ¼-in. thick.

•

Radiation Check Service: Nucleonic Corp. of America (Brooklyn, N.Y.) now offers a film-badge monitoring service for people working in the vicinity of beta, gamma, X radiation, and neutrons. A permanent record of accumulated exposure is provided—accurate to within 10%. Film badges are available in clip-on, wrist and ring styles.

•

Nuclear Steam Generator: A new liquid-metal-heated steam generator for sodium or sodium-potassium cooled reactor applications has been developed by The Griscom-Russell Co. (Massillon, O.) The unit's double-tube construction and double-tube sheets form two barriers to separate the liquid metal from the water and steam. Space between tubes and tube sheets may be monitored with a gas for rapid detection of small leakage.

•

Actuator Handwheel: The Cono-Clutch handwheel operator, now available as an integrally mounted accessory on Conoflow Corp.'s (Philadelphia) standard line of pneumatically positioned power actuators, gives immediate manual control on air failure. A push-pull knob on the face of the unit engages and disengages the operator at any position of the actuator's stem travel during throttling control.

•

Roller Mill: Sprout, Waldron & Co., Inc. (Muncy, Pa.), is out with a new line of roller mills that has a hand lever for one-point control and adjustment of the rolls. The lever activates an eccentric-mounted shaft extending the full length of the mill, instantaneously throws out each pair of rolls. And, if tramp metal gets into the

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**Others are Bay City and Saginaw on Lake Huron or connecting waters, and Muskegon, Manistee, Frankfort, Traverse City, East Jordan and Boyne City on the Lake Michigan side.*

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PRODUCTION

rolls, springs allow rolls to separate, return them to grinding position after metal passes through. The mill comes in one-, two- and three-pair high units. Rolls on two- and three-pair high units may be independently removed without disturbing the other mill parts.

•

Thermocouple Connectors: The new Quik-Konnect thermocouple connectors of Minneapolis-Honeywell Regulator Co.'s Industrial Division (Philadelphia) are claimed to make for easy, multiple thermocouple connections. The units consist of Fiberglas-reinforced phenolic plugs, jacks and multiple jack panels with tube connectors and cable clamps for mounting. Different-size plug prongs afford foolproof connection. All assemblies are integral units, allow connection of extension wires without disassembly.

•

Fireproof Cloth: Keasby & Mattison Co. (Ambler, Pa.) offers a new fire-protective, aluminized-asbestos cloth, called Kamklad, which reflects over 90% of radiant heat. A tightly-woven asbestos cloth surfaced with aluminum foil, it resists water and oil, has the corrosion-resistant qualities of aluminum. Protective clothing made of Kamklad will withstand temperatures of about 2500 F; wearer feels no discomfort or ill-effect, says K&M. Other recommended uses: fire baffles in plants, curtains in welding booths, refractories and kilns.

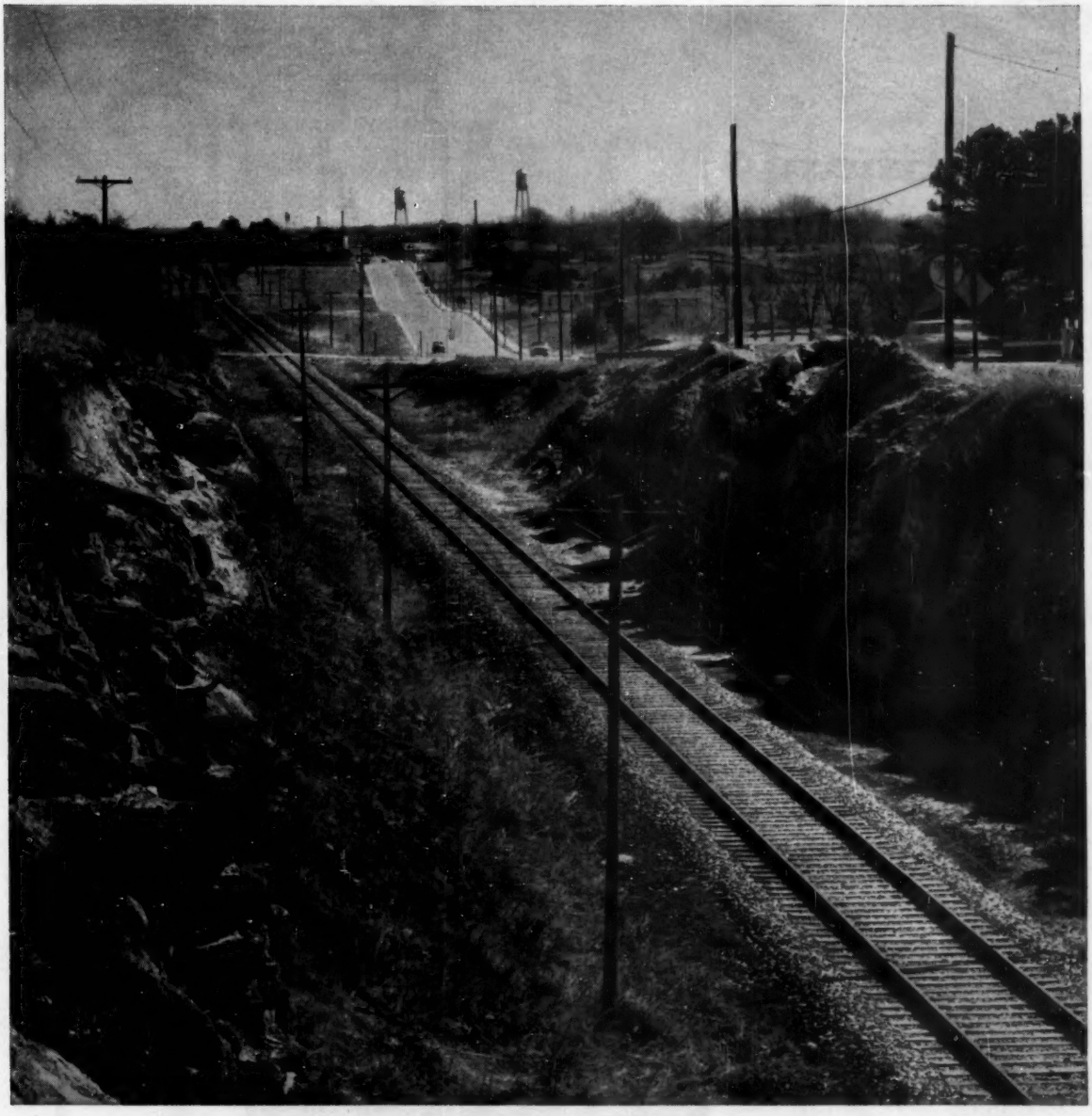
•

Positioning Control: Wallson Associates, Ltd. (Newark, N.J.), offers a new, low-cost, automatic positioning control for such applications as remote positioning of valves, dampers and conveyors. Accuracy of 0.5%, repeatability of 0.25% are claimed. The device uses bridge circuitry instead of vacuum tubes or photocells.

•

Computing Relay: Its Model 56-1 pneumatic computing relay will perform almost any arithmetical operation, can be used for flow totalizing on multiple lines, fuel-air flow ratioing and other applications, says The Foxboro Co. (Foxboro, Mass.). The relay uses the force balance principle, is converted from one type of computing function to another by substitution of springs for certain of its four bellows, receives and transmits 3-15 psi. signals.

Gastonia, N. C. . . . where Dow caustic works for textile manufacturers.



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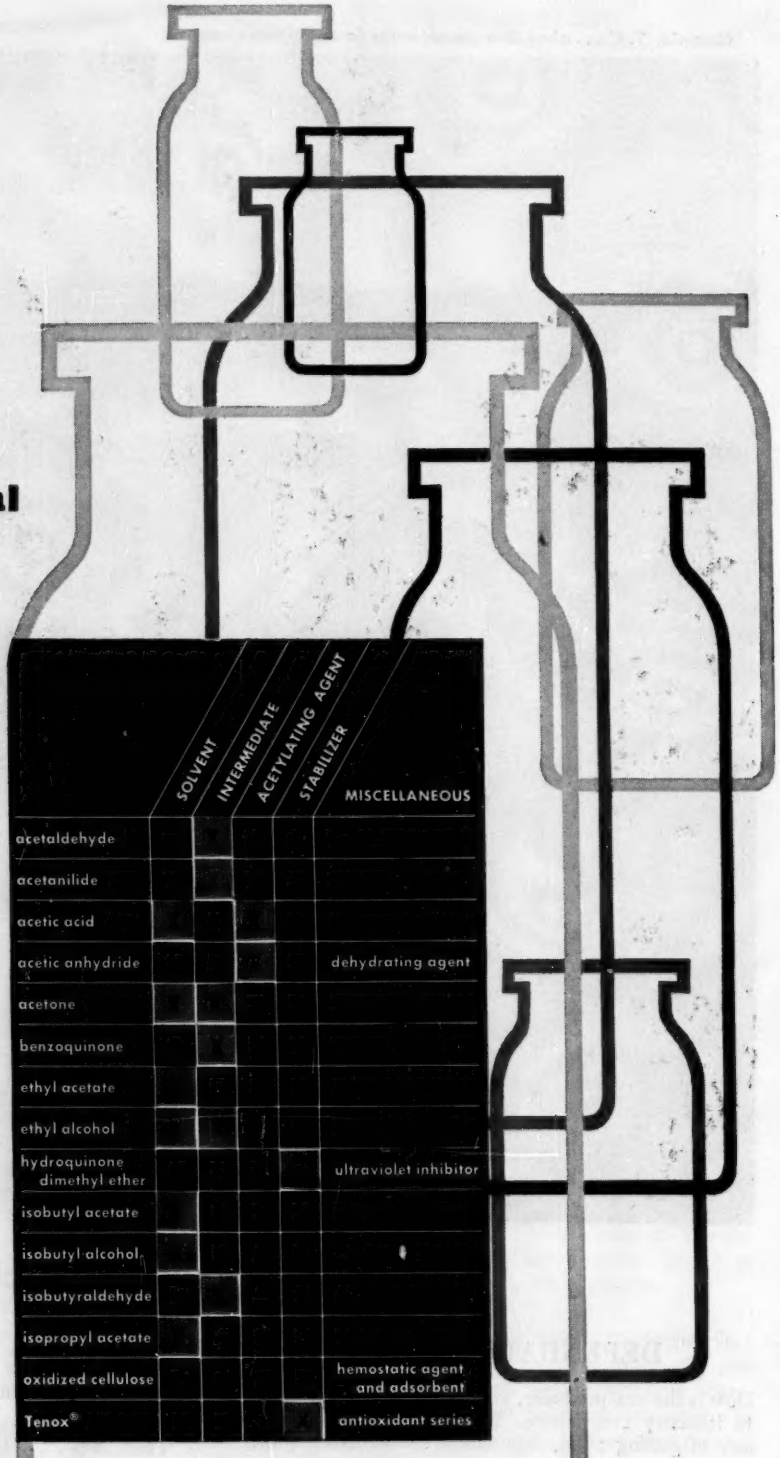

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Technology
Newsletter

CHEMICAL WEEK
December 1, 1956

Berkeley Chemical last week revealed that it had licensed the sucrose monoester ("sugar-detergent") process developed by Lloyd Osipow (Foster Snell, New York City) for the Sugar Research Institute (*CW Technology Newsletter, Oct. 8, '55*). This comes as no great surprise because Berkeley had made pilot runs on the process last year (*CW Technology Newsletter, Nov. 19, '55*). What is something of a surprise—the low cost figures being mentioned for the product.

For instance, Snell had said earlier that, based on crude sugar, the surface-active agent should be capable of hitting factory costs of 12¢/lb. Last week he said: "I have seen nothing that would make me change my mind." Osipow estimates that a 10-million-lbs./year plant could now hit factory costs of 18¢/lb., sell the product for 25¢/lb. Osipow's figures are based on a limited production scale, also take into account costs of royalties, packaging and other items. They are, therefore, a lot more realistic than Snell's.

Such costs are some distance away, however. Berkeley intends to follow Snell's policy of giving the material a price that reflects neither its cost nor its value but does insure that the organization asking for a sample is genuinely interested in evaluating it.

You can expect to hear soon that two other domestic firms have obtained licenses to the process. One is a large U. S. Chemical maker, believed to be well advanced with its investigations. The other is a sugar company whose program is thought to be in an earlier stage. Four foreign firms have also received licenses.

•

Chas. Pfizer received a patent on its lysine process (U. S. 2,771,-396). The firm has declared it is going to make the amino acid in commercial quantities (*CW Technology Newsletter, Nov. 24*).

The process is carried out in two steps. In the first, diaminopimelic acid is produced in a deep vat fermentation using a mutant of *E. Coli*. That product is converted into lysine enzymatically. Principal potential use: diet supplement.

•

Electrolytic ion exchange will soon get its biggest test in freshening brackish water close by the Persian Gulf. Ionics, Inc. (Cambridge, Mass.), has installed a unit to make 86,400 gal./day of fresh water for the Bahrain Petroleum Co. (a member of the Caltex group) at its refinery in Bahrain. And the unit is ready to start up right now.

It will be used to supply fresh drinking and cooking water to Awali, a community of 5,000 near the refinery. The water it will treat comes from wells there, contains approximately one-fourteenth as much salt as the Gulf does.

A different approach to the problem of freshening saline water is being taken by Du Pont and the Interior Dept. The two have just signed a contract for a prototype solar still made of plastic. Du Pont will supply the plastic film, Interior will build and operate the still.

Using plastic in such a still has been tried before and found promising. The difficulty was in finding a transparent plastic that would withstand weathering for three years. Du Pont came up with a formulation of Teflon flurocarbon resin that promises to be good for 10 years.

There is still much work to be done on the project, of course. But present indications are that a still could be put up for a cost of 40¢/sq. ft.; fresh water could be made from salt water for less than 75¢/1,000 gal.

•

"Gas Concrete" will be made in the U. S. for the first time in a Denver plant now being put up by U. S. Durox Corp. of Colorado. Scheduled to start up in April, the plant will operate under license from Durox of Sweden.

Essentially a cellular concrete, the product has been produced in Sweden for more than 30 years. It's made from cement, sand and lime to which powdered aluminum is added. The aluminum acts as a leavening agent, causing it to rise. The product can be sawed, nailed, bored and hewn with ordinary woodworking tools.

Another Swedish licensee, American Ytong Syndicate, is marketing a similar product in Canada, expects to launch U. S. operations with a plant in the state of Washington. In addition, it hopes to build another plant in Vancouver, B. C.

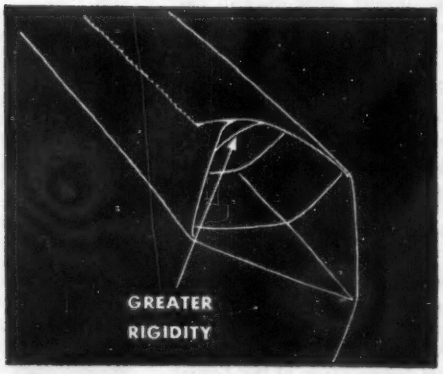
•

The case for bioflavonoids as a common cold remedy received a setback in two separate studies reported in the Nov. 24 issue of *The Journal of the American Medical Assn.* The same studies indicate that bioflavonoids do nothing to enhance the value of vitamin C in building up resistance to the malady by strengthening the capillary walls against a virus invasion.

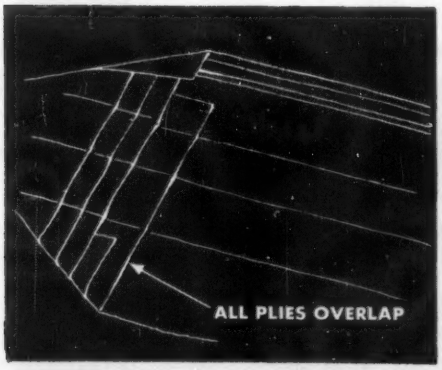
One study by the Hitchcock Foundation and the Dartmouth Medical School covered 89 medical students and student nurses. It concludes that bioflavonoids when used alone are no more effective than a placebo, and when used in conjunction with vitamin C are no more effective than vitamin C alone.

The other study, by medical directors of Sylvania Electric and Pratt-Whitney and an Ossining, N. Y., physician concluded that bioflavonoids exhibit a "singular lack of effectiveness" against the common cold.

NEW! UNION BAG GIVES YOU AN IMPROVED PACKAGE WITH THE MOST SIFT-PROOF PASTED VALVE MULTIWALL



More functional valve corner for high-speed packers. Built-in reinforcement. Easy to handle. No insert needed.



Stepped plies in bottom construction add strength, end sifting. In the new Union Stepped End Multiwall, *all* plies overlap.

Reinforced stepped end bag adds strength, simplifies handling

Now—finally and completely—you can put an end to the waste, disorder, and customer dissatisfaction caused by excessive sifting and spillage. Union's new sift-proof Stepped End Multiwall gives you better performance, greater strength, and definite packaging-line savings. You get more accurate weights; cleaner plants, cars and warehousing.

EASY PLACING ON VALVE PACKER. This new Union Multiwall saves labor, maintains packers' rhythm and speed. Built-in stiffness at the valve corner speeds the feeding operation.

NO INSERT. The Union Stepped End Multiwall does not require an insert. The valve corner itself has been designed to serve as a natural insert. No catching on the valve spout.

STRONGER BOTTOM CONSTRUCTION. Stepped (or overlapped) bottom and valve construction permits every ply to overlap. The points of greatest pressure receive maximum reinforcement.

IMPROVED VALVE. The top of the valve also has been reinforced to prevent blow out and insure against breakage on the valve spout.

ASK FOR DEMONSTRATION. A Union representative will be glad to show you samples of the new Stepped End Multiwall, along with performance records.

NOW! A TRULY SIFT-PROOF MULTIWALL!

Yes, we would like to hear more. Show us how your new Stepped End Multiwall can make our packaging operation more efficient.

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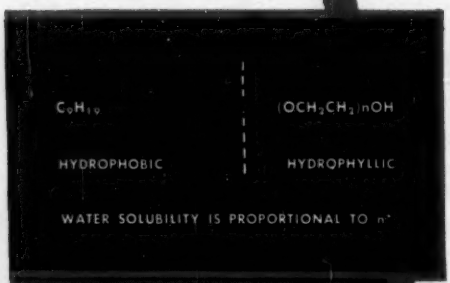
USE AN IGEPAL® CO IN YOUR PROCESS OR PRODUCT

The 8 products that comprise the Igepal CO series of non-ionic surfactants, while chemically alike, are different in ethylene oxide content, solubility and performance characteristics. They are specifically designed and performance tested for use in technical processes and consumer products requiring a stable non-ionic surfactant.

The correct hydrophobic-hydrophyllic balance of any surfactant system is essential to optimum performance. The eight products in the Igepal CO series cover the practical range of hydrophobic-hydrophyllic ratios for nonylphenol to ethylene oxide.

Furthermore, being non-ionic, the Igepals are not limited in their use because of undesired reactions with electrolytes and are stable to hydrolysis by acids and alkalis even at elevated temperatures.

To assist you in planning significant experiments in your product or process, the exact composition of the Igepal CO products are described below. Matched sets of samples are available upon request.



PRODUCT	n*	% ETHYLENE OXIDE	CLOUD POINT, 1% SOLUTION
Igepal CO-210	1½	23	Insoluble in water
Igepal CO-430	4	44	Insoluble in water
Igepal CO-530	6	54	Cloudy at 32 F.
Igepal CO-630	9-10	65	126-133 F.
Igepal CO-710	10-11	68	158-165 F.
Igepal CO-730	15	75	203-212 F.
Igepal CO-850	20	80	Clear at 212 F.
Igepal CO-880	30	86	Clear at 212 F.

*Moles of ethylene oxide per mole of nonylphenol

IGEPAL CO

SURFACTANTS ARE USED IN PRODUCTS OR PROCESSES FOR:

AGRICULTURE
BUILDING
CHEMICAL MANUFACTURING
DETERGENT COMPOUNDING
COSMETICS
DAIRY
LEATHER
METALS
PAPER
PLASTICS
PETROLEUM
TEXTILE
RUBBER

To indicate the wide range of performance characteristics available with Igepal CO surfactants, some typical uses are shown for each product:

IGEPAL CO-210

In high concentrations, serves as defoaming agent in low foaming detergents.
In low concentrations, acts as foam stabilizer for high foaming detergents.
Co-emulsifier in non-ionic surfactant blends.
Defoaming agent in cold water cleaners.
Oil soluble detergent and dispersing agent for use in petroleum oils.

IGEPAL CO-430

Oil soluble emulsifying agent.
Intermediate in the synthesis of high foaming, water soluble sulfate esters.
Oil soluble detergent and dispersing agent for use in petroleum oils.

IGEPAL CO-530

De-inking of paper.
Emulsifier for silicones and agricultural chemicals.
Oil soluble surfactant and emulsifying agent.
Detergent and dispersing agent for use in petroleum oils.

IGEPAL CO-630

Surfactant for use in all phases of textile processing.
Fast rinsing surfactant for cleaning paper machine felts.
Rewetting agent for paper towels and tissues.
Wetting agent in hide soaking and penetrant in fat liquors.
Surfactant for household and industrial cleaning formulations.
Wetting agent for use with mineral acids and corrosion inhibitors.

IGEPAL CO-710

Can be used interchangeably with Igepal CO-630 in most applications, and is particularly effective when higher temperatures are employed.
Highly efficient textile detergent in neutral, acid and alkaline media.
Surfactant in heavy duty liquid detergent formulations and in controlled suds laundry and household formulations.

IGEPAL CO-730

Surfactant for high temperature general detergency, and dispersing.
Emulsifying agent for fats, oils and waxes.
Penetrating and wetting agent in caustic solutions.
Surfactant for use with high concentrations of electrolytes.
Wetting agent for use with mineral acids and corrosion inhibitors.

IGEPAL CO-850

Surfactant for high temperature general detergency and dispersing.
Wetting agent in high concentrations of electrolytes.
Emulsifying agent for fats, oils and waxes.
Stabilizer for synthetic latices.

IGEPAL CO-880

Detergent for high temperature scouring of textiles in pressure equipment.
Stabilizer for synthetic latices.
Surfactant for high temperature general detergency and dispersing.
Emulsifying agent for fats, oils and waxes.
Wetting agent in high concentrations of electrolytes.

MANY APPLICATIONS REQUIRE A MIXTURE OF BOTH AN OIL-SOLUBLE AND WATER-SOLUBLE NON-IONIC SURFACTANT. IN SUCH CASES WE SUGGEST THE USE OF AN IGEPAL HAVING A LOW ETHYLENE OXIDE CONTENT IN COMBINATION WITH ONE HAVING A HIGH ETHYLENE OXIDE CONTENT. THIS WILL GIVE IMPROVED EMULSION STABILITY OVER A WIDER TEMPERATURE RANGE.

For assistance on complex surfactant problems, our technical staff is always available for consultation.
Technical literature on the Igepal CO surfactants will be supplied upon request. Prompt shipments can be made from warehouse stocks maintained at branch offices.

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Igepal CO surfactants manufactured by General Aniline & Film Corp. are sold outside the United States under the trademark "Antarox CO".

Heat's on Fire Retardants

In 1952, Los Angeles paint manufacturer Charles Talmadge, of Tamco Laboratories, was bubbling with enthusiasm. He had a new line of flame-resistant coatings, saw his company headed for the "big time"—heavy production, nationwide distribution. This week Talmadge was in a soberer mood. "Flameproofing really hasn't paid off," he says. "We've gotten little interest; we've been completely unable to arouse insurance companies."

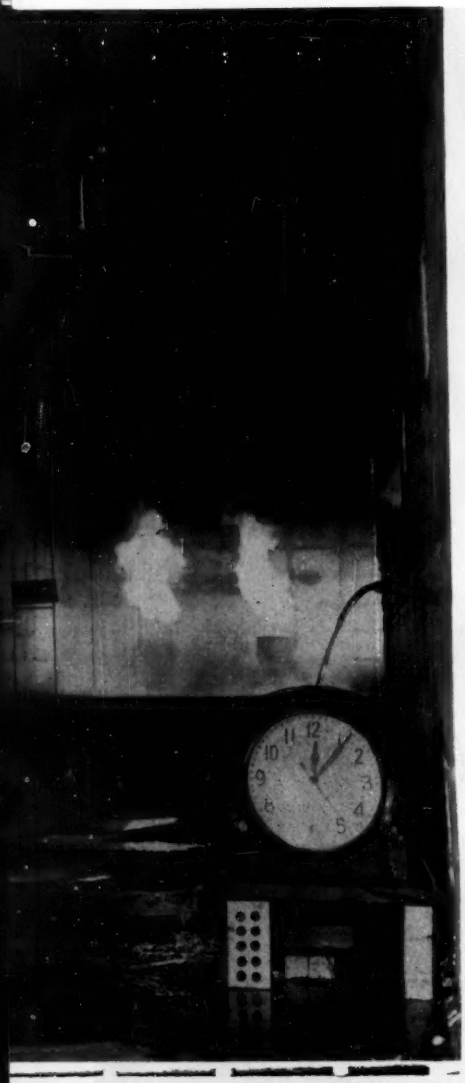
Thus, Talmadge pinpointed the dilemma facing the entire fire-retardant coating and impregnation industry: it can't sell its products in anything approaching large volume unless it can show customers a saving in insurance.

Slow Burn: So far, most sales have been to the government, principally for military purposes. But even this hasn't been much of a boon to retardant paints. Most government specifications are so mild that "fire inert" paints (which don't burn) may be used instead of fire-retardant paints, which slow the spread of flames through wood.

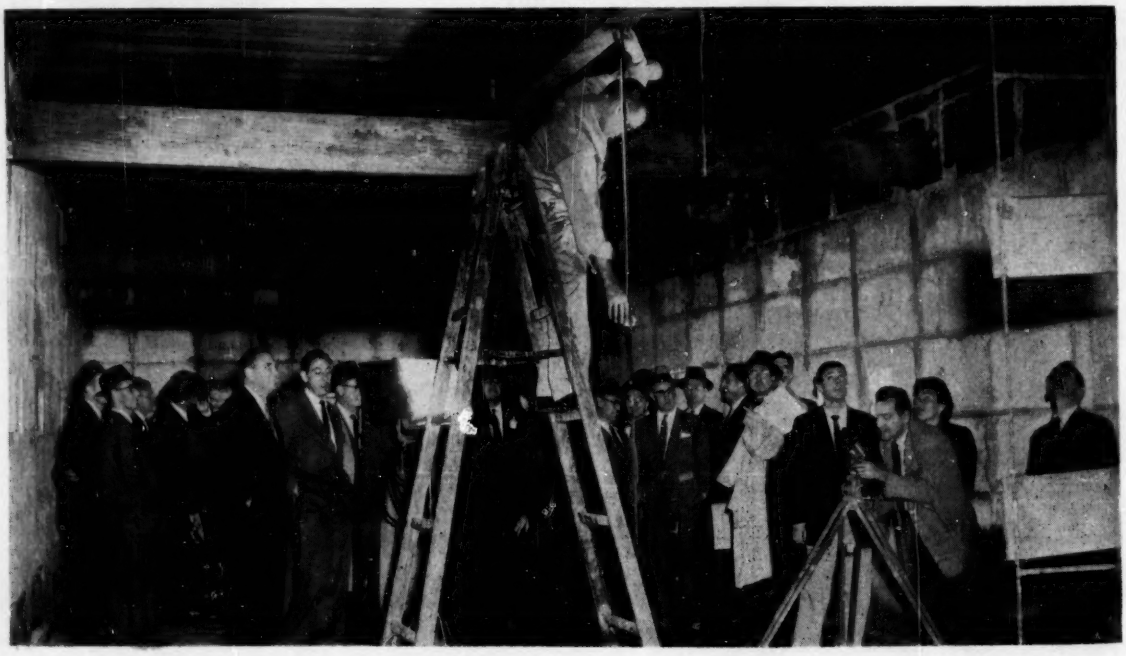
Consequently, current sales of fire-retardant paints to industry are estimated to be only about 350,000 gal./year (sales for use in houses are almost nonexistent, and will probably so remain; home fire insurance rates are too low to be cut further). Business is definitely slow, much slower than most participants anticipated.

Like Koppers (*see cuts, pp. 78 and 80*), most retardants makers

Continued on p. 82



TIME TO BUILD A FIRE under slow sales of fire retardants, believes Koppers Co., here testing wood impregnated with firm's product. It has been a relatively slow mover.



INSURANCE MEN watch technician set up test. Company hopes they will be impressed by demonstration, put treated wood in same rate class as steel.

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In Plastics—If you premix or liquid mold in reinforced plastics, an ASP filler will put you in line for improved properties, excellent finish, low costs.

In Adhesives—ASP additives pave the way for paper converters and other adhesives users to better their picture in production, quality, costs.

In Printing Inks—ASP fillers and extenders hold process pluses: excellent wetting, dispersion, suspension; emulsification and water-breakdown resistance; printing press superiority.

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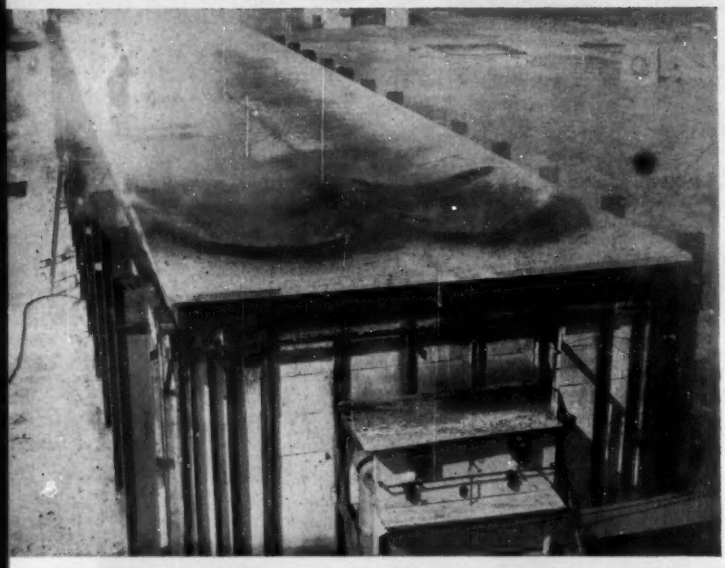
FLAMES BREAK THROUGH, as expected, after roof has withstood 40 minutes of exposure to blazing atomized gasoline, at 2000 F. Scene is Factory Mutual Assn.'s 'White House' test chamber in Norwood, Mass. FMA oversaw arrangements.



FIRE'S OUT, of its own accord, minutes after gasoline is turned off. Wood was treated with ammonium phosphate salts, which control flame-spreading vapors. Other retardants blister under heat, form protective coating on wood.

REMAINS ARE EXAMINED by insurance men who find that only wood in direct contact with flame burned. Koppers is awaiting official report, hopes it will favorably impress rate-setters across the country, trigger a sales spurt.

Qik fast-setting liquid plastic is used in taking impressions for dental plates. It is mixed with a powder. Both the bottle and the powder are individually packaged in polyethylene bags. They are combined into a neat package by wrapping the bag containing the powder around the bag containing the bottle, placing them both in a larger polyethylene bag and inserting in a shipping canister.

polyethylene packaging has

Extended the shelf life

"Due to polyethylene," reports E. H. Lockridge, general manager, Dental Perfection Company, Glendale, Calif., "our products are good for two to three years even in the tropics, and almost indefinitely in cooler, drier climates. Returns have been cut from 5% to less than 0.1%. Certainly, a great deal of our sales increase is directly attributable to polyethylene packaging.

"A major distribution problem has been eliminated also . . . that of air shipments where packages are subject to rapidly changing air pressures. Other materials frequently burst but, due to its superior strength and ability to 'breathe,' we have yet to have a polyethylene bag damaged by pressure changes."

The advantages of packaging in film made of BAKELITE Brand Polyethylene are considerably more than just its superior chemical resistance. Get the complete story from your packaging supplier or write for our "Guide to Packaging" booklet to Department VH-34.

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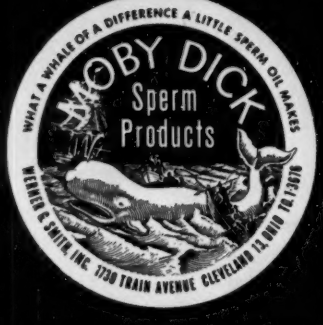
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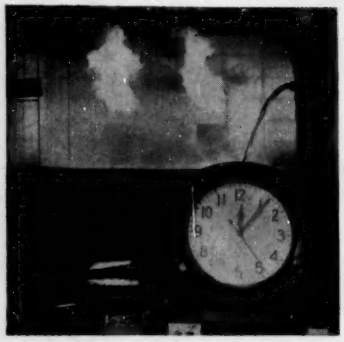

are directing their major efforts toward getting the insurance companies to offer the necessary kind of saving. A first step, of course, is to get on Underwriters Laboratories' official list. To be eligible a product must reduce flame spread 30% or more, or to 70 or less on the U.L. classification scale,* whichever represents the least spread of flame. Not stopping here, however, the companies are also submitting their products to any and all tests, actively searching for publicity, helping rate-setting boards with technical problems.

Western Frontier: These efforts are beginning to pay off. On the West Coast, for example, the Pacific Coast Rating Bureau has established a 5-10% rate reduction for plants protected with a coating that reduces flame spread to 50 or below on the UL scale. A scattering of other states offer similar reductions on certain classes of buildings protected with retardants.

Other state and regional rating boards are now considering similar action. At the same time, building codes are being revised in some areas to encourage use of retardants. These specify that in multiple-family dwelling units or in places of public assembly, interior wall surfaces must have a flame spread below a given number (usually around 50).

Some states (including New York), on the other hand, are tending the other way. They feel that crediting fire retardants in rate structures is an overrefinement, that attention to such details would require complicated distinctions between various construction techniques. These states have for the past few years, in fact, been simplifying rate structures, basing rates only on a few broad classes of industry and building types.

Some savings in insurance rates have been realized by retardant users for a number of years. This has been on an individual, case-by-case basis, principally in the form of lower penalties or eliminated penalty clauses when plant changes have been made. Penalty clauses increase the rates for a plant if additions of new sections, partitions or manufacturing operations increase the fire hazard in the opinion of the insurance company. Unlike the basic rates, which are specified by state rating boards, penalty-clause rates are assessed on an individual basis. Use of a fire-retardant paint might be one of the elements that will influence inspectors looking for hazards.

Who Pays? The importance of such boosts—particularly the insurance advantage—becomes clear when you examine the cost situation. Although the fire-retardant coatings and impregnations don't add a staggering amount to construction and maintenance costs, they do add to the cost of doing business.

Most companies are well protected by fire insurance, often even carry insurance against lost production, and thus have little financial fear of fire. They regard such fire-resistant materials as a boon to the insurance companies, a burden to themselves.

If a rating advantage should become general, on the other hand, producers of retardants expect a spiral effect. They reason that it would lead to considerably greater sales, which in turn would allow lower prices, bring in still more customers.

As the trend toward official acceptance of retardants becomes more general—and the first eddies of the spiral are being seen—producers are again becoming optimistic. Not all are talking like Talmadge. B. J. Tyler, of retardant-coating pioneer Albi Mfg. Co., for example, looks to a day when virtually all exterior and interior maintenance paints on plants and public buildings will be of the fire-retardant type. Coatings makers believe that insurance men won't really be impressed until they witness the value of retardants in a big blaze.

*100 corresponds to the time it takes flame to spread through 24 ft. of untreated red oak (5:30 minutes.) Firms with fire-retardant coatings on U.L.'s list: Albi Manufacturing Co., Inc., (Rockville, Conn.); Ceilotex Corp. (Chicago); Flamort Chemical Co. (San Francisco); the Glidden Co. (Cleveland); Ideal Chemical Products, Inc. (Culver City, Calif.); Morris Paint & Varnish Co. (St. Louis); E. H. O'Neill Floors Co. (Cicero, Ill.); with impregnations: Koppers; Protexol Corp. (Kenilworth, N.J.).

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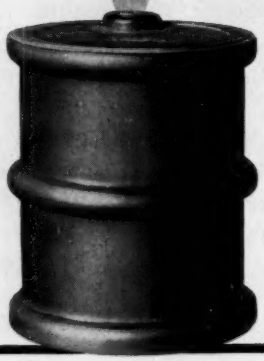

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SPECIALTIES

PRODUCTS

Foiling Flames: Typical of the many products specialties makers have devised to reduce fire loss (*see above*) are these new entries:

- Pecora Paint Co., Inc.'s (Philadelphia) nonflammable tile adhesive. The new material permits workers to smoke while applying the adhesive, without fear of fire.
- A wood impregnant, which adds such qualities as fire resistance, hardness, increased dimensional stability, and color. Patent on the development (U.S. 2,768,910) is assigned to Badische Anilin- & Soda-Fabrik Aktiengesellschaft (Ludwigshafen, Germany).

•

The Word: Full report of the Chemical Specialties Manufacturers Assn. May (1956) meeting is now available. The 186-page volume ($7.50) is sold by the association, 50 East 41st St., New York 17.

•

Atomic Lube: Building Britain's new Calder Hall atomic power station (*CW, Oct. 20, p. 74*) posed some novel specialties problems, one concerning selection of suitable lubricants. The atmosphere of carbon dioxide (which transfers heat from the reactors to the steam generators) ruins most lubricants, and nuclear radiation destroys others. The solution, according to Rocol, Ltd. (London), was to use a varnish containing molybdenum disulfide. The moving parts were coated with the varnish, which left a film of MoS_2 on the parts. Called Molytox, this dry lube has so far proved satisfactory; in "wet" applications, where moisture resistance is needed, Molytox is formulated with a water-repellent silicone.

•

Squish in Time: Stitching, to apply flowers, ornaments, beads, linings, ribbons, etc., to fabric, can be replaced by a new liquid plastic adhesive called Resgrip. Available for application by squeeze bottle, brush or machine, the adhesive is made by Adhesive Products Corp. (New York).

•

Chimney Sweep: Soot, which cuts the efficiency of oil, gas or coal heating systems, can be burned away with the aid of a new aerosol product. Sprayed on the soot, the product (nonflammable) reduces the ignition point of the soot so that it can be burned away with a newspaper torch. The product is called Sootspray, is made by Stewart-Hall Chemical Corp. (Mt. Vernon, N.Y.). It retails at $3/12-oz. container.

PATENTS

Coat for Grain: Novel use of flexible thermoplastic resins has been conceived by Fred Lewis (Brady, Mont.). He suggests that grain such as corn and wheat can be protected by coating the heaped material with a weatherproof film of resin applied by spraying (U.S. patent 2,768,896).

•

Bug Chasers: Phillips Petroleum Co. (Bartlesville, Okla.) has been issued a patent (U.S. 2,768,926) on its cumene hydroperoxide insect repellents. Lyle Goodhue developed the compounds for Phillips.

•

Blaze Snuffer: Light-metal fires reportedly can be put out with a dry compound developed by Specialties Development Corp. (Belleville, N.J.). The material is essentially sodium chloride (45-80 parts) and hydrogen phosphate (55-20 parts).

•

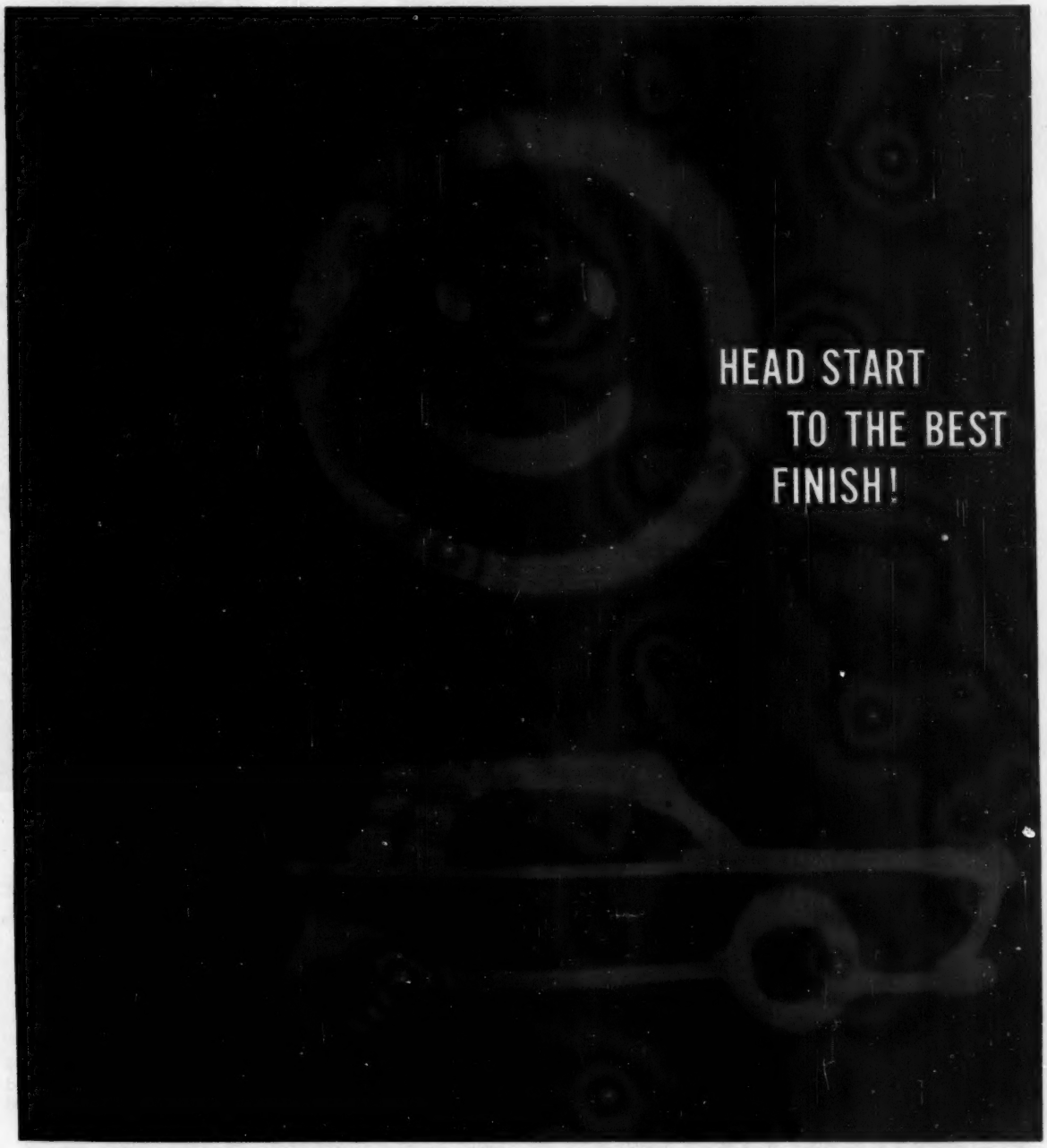
Dextran for Dentifrice: Colgate-Palmolive has recently suggested dextran (either in its native form or partly depolymerized)—along with an organic detergent—for dentifrices (British patent 753,737). The dextran is said to improve the products' stain-removing qualities.

•

Corrected Credit: Credit George Barker and Atlas Powder Co. with the development of a low-freezing liquid (U.S. patent 2,767,145) containing formamide, ethylene glycol and water. *CW* attributed it to Atlas's Wilmington neighbor, Hercules Powder Co.

•

Aerosol Art: Judges have been named for the fifth annual aerosol packaging contest to be held in conjunction with the Chemical Specialties Manufacturers Assn. Dec. 4 meeting in Washington, D.C. They are Donald Deskey, of Donald Deskey Associates; Miss Antoinette Donnelly, beauty editor of the New York *Daily News;* Julien Elfenbein, editor of *Housewares* magazine; Edward Molyneux, vice-president of Cunningham & Walsh, Inc.; and John A. Warren of the American Management Assn.



Solvesso 150 has long been a standard solvent in baking-alkyd surface coatings used in the automotive industry. Unsurpassed in uniformity and purity, it is an outstanding member of the high-quality Esso family of aromatic solvents, the solvents that set performance standards *throughout* the paint and surface coatings industry. Esso's excellent customer service combines with the most modern handling methods and key distribution centers to assure you of a constant supply and *immediate* delivery. For a head start to the best finish, always specify Esso Petroleum Solvents. Write, wire or phone today! Esso Standard Oil Company, 15 West 51st St., N. Y. 19, N. Y.

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High-Quality Aromatic Solvents covering the full range of industrial needs

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PETROLEUM SOLVENTS

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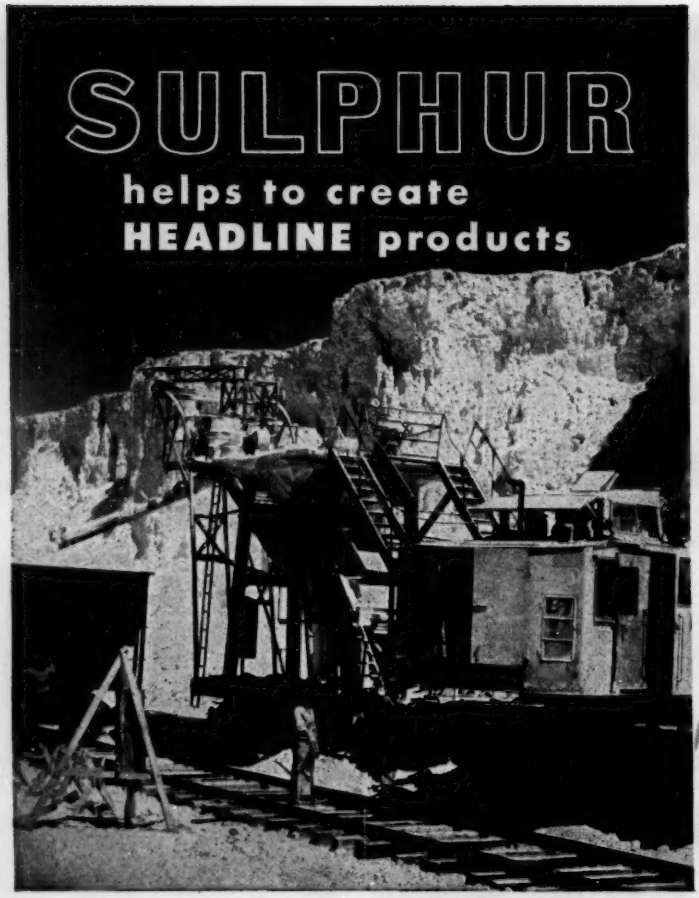
helps to create HEADLINE products



Thiokol®

"Thiokol" synthetic rubber, is an organic polysulfide elastomer. One of its many uses is in solid propellents for long range and high altitude missiles. In liquid form, "Thiokol" synthetic rubber mixed with an oxidizer, is poured into specially designed combustion chambers of rockets. It helps to give stability to the fuel charge and resistance to shock. It promotes uniform burning. When the rocket motor is ignited the mixture burns with great intensity and generates large volumes of gas to propel the rocket.

Solid propellents made with "Thiokol" synthetic rubber have proved their value in rockets over liquid propellents in many ways: they are less costly and easier to manufacture—simple and rugged construction makes handling and launching easier and safer—fuel tanks and complicated feed systems are eliminated.

"Thiokol" synthetic rubber is a product containing a high percentage of Sulphur—its name being derived from the Greek words for sulphur and glue. Here is another example of the continually broadening field in which Sulphur is an important and necessary element.

**A trade name of Thiokol Chemical Corporation.*

Texas Gulf Sulphur Co.

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811 Rusk Avenue, Houston 2, Texas

Sulphur Producing Units
- Newgulf, Texas
- Moss Bluff, Texas
- Spindletop, Texas
- Worland, Wyoming

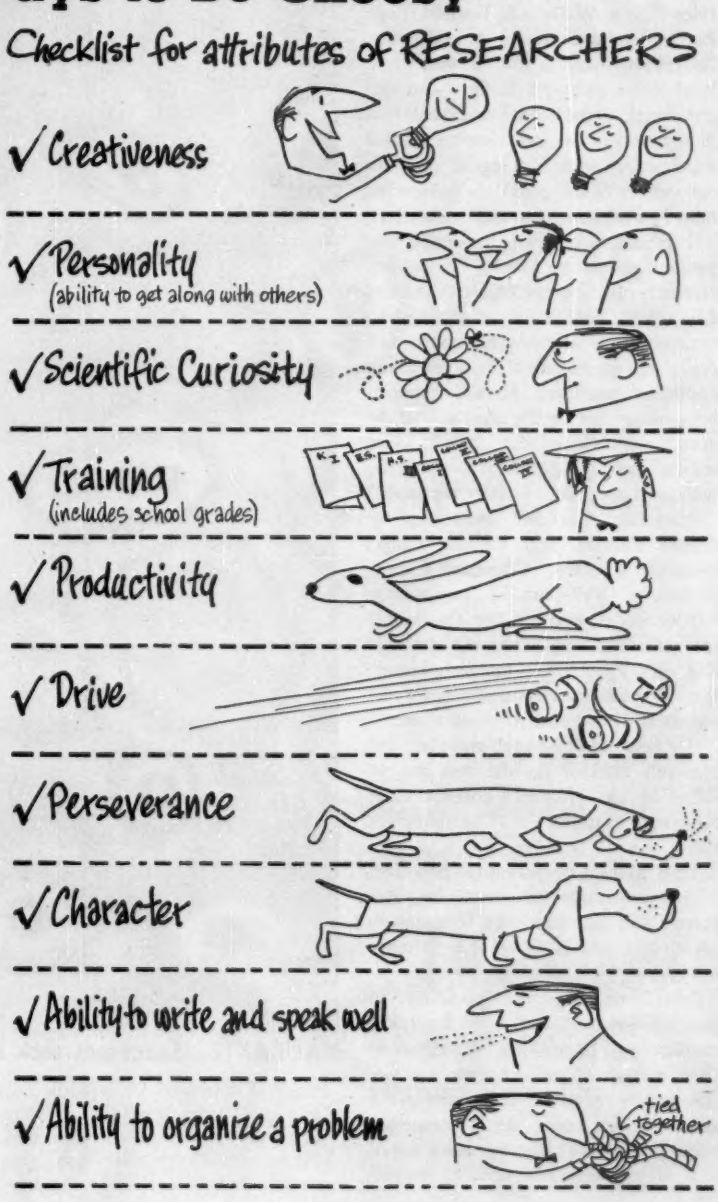
Hiring: It Still Pays to Be Choosy

Don't lower your employment requirements for new researchers just because the latter are hard to find. That's the consensus of some of the keenest research executives in the chemical process industries. Many of these men today are revising specifications upward, for new men represent a bigger investment than ever before, both in salary and in facilities. A wrong selection may prove expensive and—as experienced research directors have learned—quantity is no substitute for quality in staffing a research laboratory.

Selection techniques are changing in response to the increasing value of researchers and increasing demands placed upon them (*see checklist, right*). There's new emphasis on interviews to evaluate the candidate's personality (an important factor in team research). And tests to evaluate creativeness and productivity—hard-to-predict qualities—are in use or being developed.

No Retreat: A few companies confess that they have lowered their hiring standards slightly. One West Coast firm, for instance, now looks at the upper 25% of graduating classes, whereas it formerly considered only the top two students. But most are either maintaining hiring standards or raising them.

F. J. Gejweski, process research and development manager at General Aniline & Film Corp.'s Linden, N.J., laboratory, comments: "We've kept positions open for several months before making a selection that we felt to be suitable." And that's pretty much the experience of most top-flight labs. American Potash & Chemical Corp.'s (Los Angeles) vice-president of research, Joseph Schumacher, puts the case this way: "We'd rather go with-



out than hire an individual we consider mediocre."

John Scudi, research director at Wallace & Tiernan (Belleville, N.J.)—manufacturers of pharmaceuticals, organic chemicals, etc.—sees a trend toward even greater strictness in researcher selection. "We're willing to pay the price," he declares, "but only for the good ones."

Personality Premium: Scudi has given a lot of thought to screening techniques and ways to improve them. Personality of employment candidates rates high at Wallace & Tiernan. Each Ph.D. candidate under consideration for employment is interviewed by at least three technical staffers and one personnel department representative. A key man in the interviewing team is a physician with training in psychology, whom Scudi considers to be a big help in evaluating prospective staffers.

Personality is an increasingly important criterion. Savery Coneybear, research director at Colgate-Palmolive Co. (New York), for example, isn't enthusiastic about nonconformist types. He is interested in whether an applicant considers himself superior because of his Ph.D. degree. "If he does," says Coneybear, "it's a good indication he'll be difficult to get along with and to integrate into the staff."

National Carbon's (division of Union Carbide and Carbon Corp.) research director, Clarence Larsen, prefers a well-rounded personality, but concedes a place for the highly individualistic researcher. At National Carbon's Parma, O., research center, there are one-man laboratories for the top men who prefer to work alone.

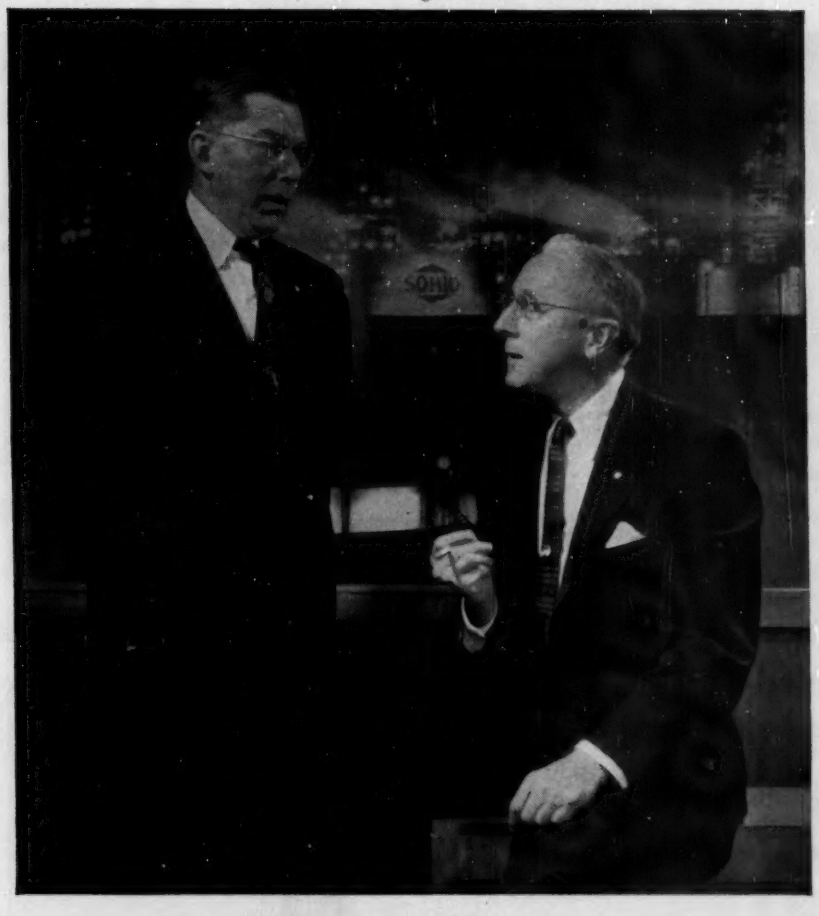
To help its personnel manager and research director do the best job of sizing up an applicant's compatibility, American Marietta Co. (Chicago) gives them special training.

Idea Men: Compatibility, however, is no substitute for creativity. But there's still no sure way to measure creativity—and if there were, there's no guarantee it would be used.

Interviews are the stand-by in gauging this trait. But A. F. Kaulakis, manager of employee relations at Esso Research and Engineering Co. (Linden, N.J.), says: "It is quite probable that we could do a somewhat better job of selection by using a battery of psychological tests to supple-

SCUDI: 'We're willing to pay . . . for the good ones.'

KAULAKIS: 'Successes pick men who will succeed.'



F. W. Engle, Sohio's Manager of Purchases (standing), discusses the growth of the petroleum industry with Senior Buyer F. R. Eshelman.

"It takes a lot of people at Sohio to care for your car"

—F. W. Engle and F. R. Eshelman

"It takes a lot of people at a major oil company like Sohio to make the products that you use in your car. To provide our people with the best possible raw materials to work with, we, as purchasing members of the team, must evaluate each purchase thoroughly.

"Not only do all ingredients selected have to meet Sohio's high standards, but we must be satisfied that each supplier has the resources, facilities, and ability to be a working member of our team. Only in this way can we be sure that we are doing our part in keeping Sohio a step ahead.

"We have found the products and services of many chemical companies very helpful to our growth and rapid product development . . . Wyandotte is one of these companies. They are one supplier of ethylene glycol for Atlas Perma-Guard anti-freeze. When we place an order with Wyandotte's representative, we know, by experience, that our requirements will be met on time—and also that co-operation and service, after the sale, will be available."

Wyandotte Chemicals serves the petroleum industry with ethylene glycol for anti-freeze, Carbose* for drilling muds, caustic for "sweetening," and soda ash for water conditioning, to name a few. Wyandotte also makes products that go into paper, textiles, metals, washing and cleaning products, food, pharmaceuticals . . . almost everything you can see, taste, or touch.

How about *your* business? If you're looking for a dependable source of chemicals, backed by years of experience in many industries, you'll want to find out about the consistently uniform quality of Wyandotte's products, and the dependability and scope of Wyandotte's service. Why not talk over your requirements with a Wyandotte representative, or write us, giving details about your chemical needs? *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

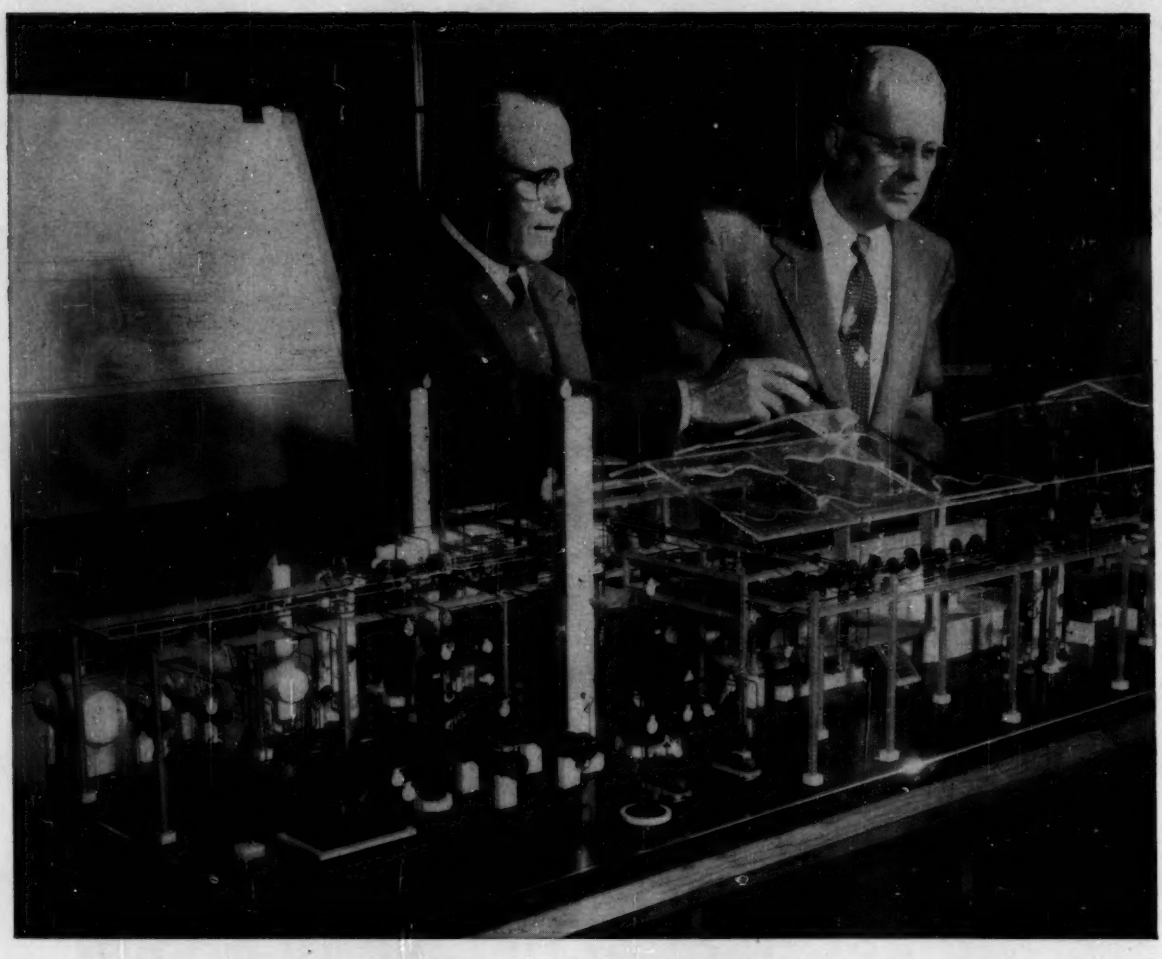
*REG. U.S. PAT. OFF.

Wyandotte

CHEMICALS

HEADQUARTERS FOR ALKALIES

Soda Ash • Caustic Soda • Bicarbonate of Soda • Chlorine
Muriatic Acid • Calcium Carbonate • Calcium Chloride
Glycols • Chlorinated Solvents • Synthetic Detergents
Other Organic and Inorganic Chemicals



"Here's an example of Pritchard's work, Mr. Ross. One hundred tons of dry ice per day!"

"What part did Pritchard play in building this carbon dioxide plant?"

"The whole works! Design, engineering, supply and construction in six and one-half months. This model was prepared before we started the job for Standard Oil Co. of Ohio."

"It looks very interesting. Tell me more about the plant."

"Well, in addition to its capacity to produce 100 tons of dry ice per day, Standard can also divert production to as much as 100 tons per day of liquid carbon dioxide when they want to. There are a couple of other interesting facts about this plant, too."

"For example?"

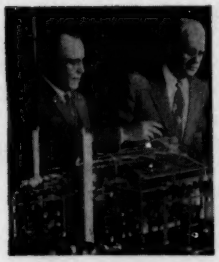
"First of all, Pritchard handled both the on-site and the off-site facilities. The inside battery limit work consisted of the processing unit itself, the loading dock, conveyors, the dry ice presses, sawing equipment and packing facilities. The off-site work included the rail sidings, paving, all feed and utility piping from the battery limits, in fact, everything they needed."

"You said there were a *couple* of interesting facts."

"Right! And here's a unique feature. These facilities were built to utilize a raw material stream of carbon dioxide being produced by an *existing* monoethanolamine absorption unit in Standard's plant. In other words, they are turning waste into profits. The plant is designed to permit economical operation at 60% of design capacity."

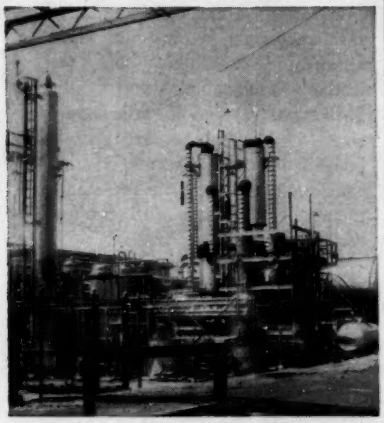
"I must say you've convinced me that Pritchard has the ability!"

J. F. PRITCHARD & COMPANY
4625 Roanoke Parkway, Kansas City 12, Missouri



"Here's an example of Pritchard's work, Mr. Ross. One hundred tons of dry ice per day!"

If you want proved ability . . . choose Pritchard!



Time after time, Pritchard designers, engineers and construction superintendents have proved the fact that they know their way around in the chemical processing field.

Pritchard knows how to give you the facilities you need for handling liquids, solids and gases, fractional distillation, gas absorption, evaporation, crystallization, filtration and heat transfer as they are applied to the chemical industries.

Whatever your chemical processing needs, your first step in the right direction is to . . .

Consult with Pritchard!

YOUR INQUIRY IS INVITED!

INDUSTRY'S PARTNER FOR PROGRESS

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BOSTON, CHICAGO, BUFFALO, HOUSTON, NEW YORK, PITTSBURGH

ment our present procedure. Whether we would do significantly better is a debatable point; the wisdom of using any extensive battery of tests in today's tight market is quite questionable because the good technical graduates don't like to take such tests before receiving a job offer."

"Frankly," he confides, "we rely heavily on the judgment of our top technical people. They do the final selecting. I guess you could say we believe that successes generally pick men who will succeed. We do, of course, weigh carefully such items as grades, faculty evaluations and previous jobs, and we study an applicant during interviews to try to estimate his initiative, drive and ability to think on his feet."

Help on the Way: Despite the widespread reliance on empirical methods to evaluate creativity, plenty of research on evaluating this elusive quality is in progress.

Industrial Research Institute (New York) is sponsoring a program at the University of Chicago's department of psychology. Some 65 member companies of IRI are participating. A creativity guide based on written tests and interviews is under evaluation, expected to yield definite results in about a year. Another creativity measure, still in the planning stage, is being developed at American Institute for Research (Pittsburgh).

Productivity, Too: Productivity—the ability to achieve results—is also being studied at AIR. AIR's president and director, John Flanagan, and his staff have worked out a test that includes a measurement of this trait.

In preparing this test, AIR defined eight areas in which research workers were succeeding or failing: formulating problems and hypotheses; designing the investigation; conducting the investigation; interpreting results; preparing reports; administering research; accepting organizational responsibility; accepting personal responsibility.

Several companies are evaluating the test, and one reports favorably.

It's still a flip of the coin whether experienced researchers or new graduates are more in demand. While there may be less risk in hiring men with industrial experience and proved capabilities, young graduates offer adaptability and enthusiasm. But on one point there's no speculation. In hiring either, it pays to be selective.

WIDE WORLD

BROWNELL: He sees 'grave implications for the future. . .'

Time for a Change In Patent Policy?

Smaller firms will get a bigger share of government research contracts if Attorney General Herbert Brownell has his way. He recently warned Congress of a tendency toward concentration of federal research among large companies. Part of Brownell's quarterly report on activities carried out under the Defense Production Act, his statement suggested "grave implications . . ." if the trend continues.

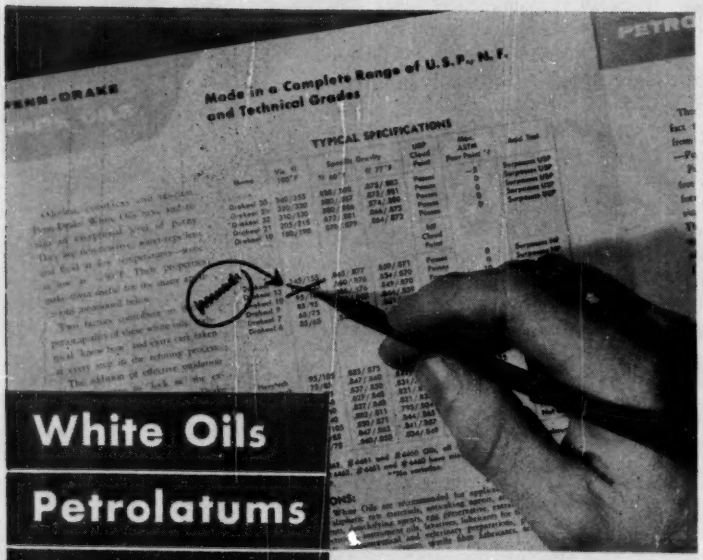
Although he admits there is no way to measure this accurately, he feels the data that is available supports his view. One reason why small contractors often can't compete for federal research contracts is because they lack sufficient capital. To remedy this, Brownell suggests that the government pay all costs of government contract research instead of only part of them.

That could mean a sweeping reevaluation of patent policy. Reason: individual firms that develop patents under government research grants now own the patents, allow the government to use them on a nonexclusive basis. Contractors feel entitled to the patents because they often share in the costs of development.

Now, Brownell is calling for a study of patent policy to ascertain how big companies benefit through ownership of patents stemming from their government-sponsored research.

We alter our specifications

...TO IMPROVE YOUR PRODUCT



White Oils

Petrolatums

Solvents

Sulfonates

If a small change from the established specifications of any Penn-Drake product will help your processing procedure, or assure *you* of a better product, we will make the change for you. For example, we can furnish white oils with specific viscosities, pour points or other properties . . . petrolatums with unusual consistencies and specific melting points.

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RESEARCH PRODUCTS

• Seven new biochemicals are available from Schwarz Laboratories, Inc. (Mount Vernon, N. Y.): N-acetyl DL-homocysteine thiolactone reacts with amino groups of amino acids, peptides, or proteins at low temperature under mildly alkaline conditions, provides new possibilities for crosslinking through disulfide bonds. It's expected to be valuable in medical, food, rubber stabilization and textile processing research. Cysteinyl glycine features a reactive sulfhydryl group, can be used in research on synthesis of higher peptides and transpeptidization. Five radiochemicals — inosine, xanthine, xanthosine, xanthylic acid (mixed isomers xanthosine 2'- and xanthosine 3'-phosphates) and inosinic acid (inosine 5'-phosphate)—are specifically labeled in the carbon-8 position of each molecule. They're for studies of metabolic pathways and for use in cancer research.

• A new dry form of vitamin E (DL-alpha-tocopherol acetate), which features stability and ease of handling in production of multivitamin tablets and dry granular preparations, is now offered by Hoffmann-La Roche Inc. (Nutley, N. J.) vitamin division.

• A special anti-radioactive molybdenum disulfide-based varnish for use in lubricating control mechanisms in nuclear reactors has been developed by England's Rocol Ltd. (Swinnington, Leeds). It's in use at Britain's new Calder Hall atomic power station *(CW, Technology Newsletter, Oct. 13).*

EXPANSION

• Carbide and Carbon Chemicals Co. (division of Union Carbide and Carbon Corp.) plans to erect a multimillion-dollar engineering building near its present research facilities at South Charleston, W. Va. A five-story structure, it's expected to be ready by the first quarter of 1958, house 500 staffers engaged in designing new chemical processing equipment and plants. Carbide is also readying a nearby 18-acre site for construction of a multimillion-dollar research and development laboratory. Estimated time of completion: mid-1958.

• The Herty Foundation (Savannah, Ga.) will receive $300,000 in state funds to build and equip a new research laboratory for forest-product studies.

Inco high-temperature research note:

Oxidation

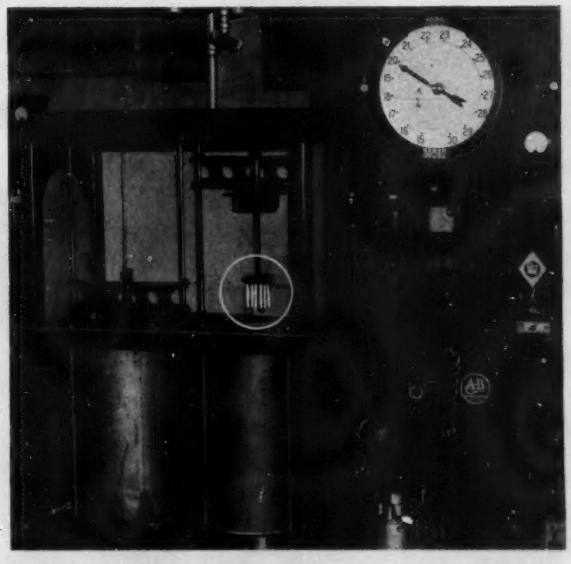
...and its effect on metals at high temperature

High-temperature corrosion is one of the basic processes by which metals fail, and oxidation is truly a process of high-temperature corrosion.

The formation of an oxide film is accompanied by a change in volume that puts the film under compressive stress. Subsequently, when the underlying metal cools, it contracts, further aggravating the stress situation. Eventually, under repetitive heating and cooling cycles the normally protective oxide may rupture from the metal surface.

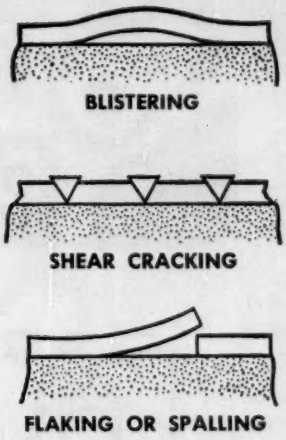
Obviously, such ruptures result in progressive loss of useful load-carrying metal by oxidation.

Resistance to oxidation, therefore, is notably affected by the behavior of the oxide scale. It may be a tightly adherent protective scale, or it may break down in one of the ways shown in the sketches, and thus accelerate oxidation.



Machine especially designed by INCO engineers for determining the effect of cyclic heating and cooling on sheet metals while exposed to oxidizing conditions. Through work with this and other types of equipment, Inco High-Temperature engineers investigate actual cause of damage and how metals fail at high temperatures. Thus, their research can establish the materials most suitable for specific applications.

Oxide Scale Breakdown by:



Blistering may occur in oxide layers having good elasticity but poor adherence to the metal surface.

Shear cracking on the other hand will be found in oxides that are adherent but relatively brittle.

Flaking or spalling results when the oxide is both brittle and non-adherent.

When scale peels away, fresh areas of metal are exposed to attack. Accordingly, the economy of alloys that provide tight, adherent scale is self-evident.

Inco has investigated metals and alloys by the hundreds, under high-temperature operating conditions. Our data and experience have aided many industries. Maybe we can help you, too, where your metal problem involves high-temperature performance in corrosive media. Send for our High-Temperature Work Sheet . . . on which you can easily outline for us the details of your difficulty. Use this coupon now.

The International Nickel Company, Inc.
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Please send me the High-Temperature Work Sheet so that I may outline my problem to you.

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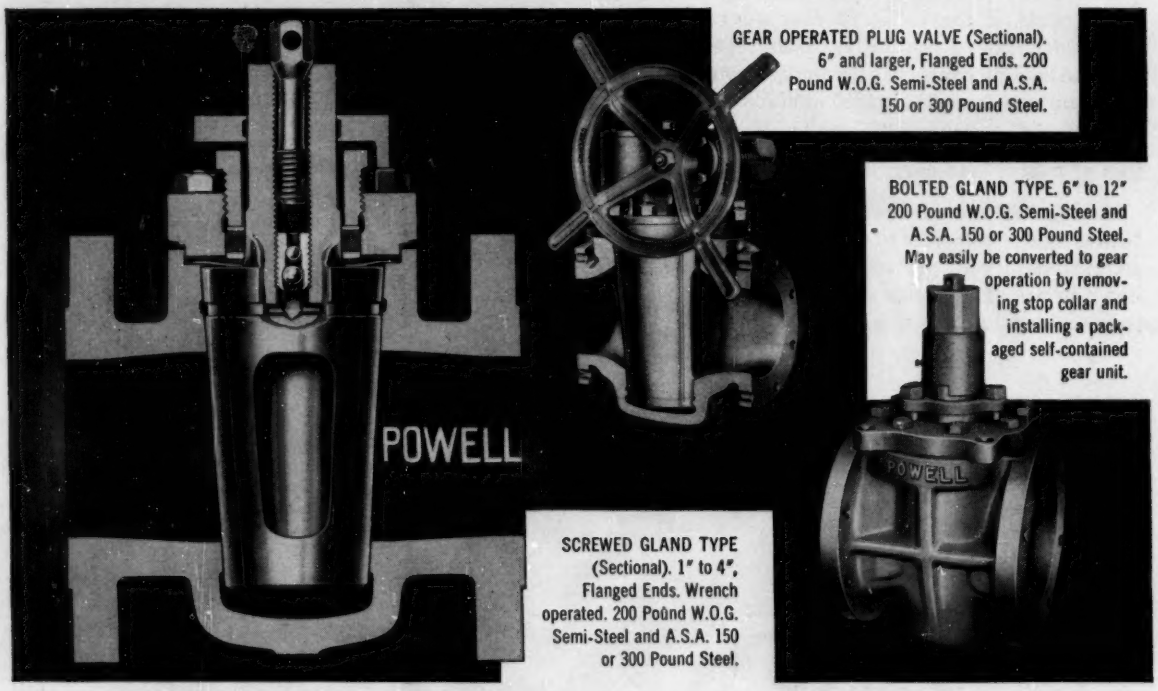
POWELL

Lubricated Plug

VALVES



GEAR OPERATED PLUG VALVE (Sectional). 6" and larger, Flanged Ends. 200 Pound W.O.G. Semi-Steel and A.S.A. 150 or 300 Pound Steel.

BOLTED GLAND TYPE. 6" to 12" 200 Pound W.O.G. Semi-Steel and A.S.A. 150 or 300 Pound Steel. May easily be converted to gear operation by removing stop collar and installing a packaged self-contained gear unit.

SCREWED GLAND TYPE (Sectional). 1" to 4", Flanged Ends. Wrench operated. 200 Pound W.O.G. Semi-Steel and A.S.A. 150 or 300 Pound Steel.

Powell Lubricated Plug Valves maintain our 110-year tradition of quality and precision. Only the finest available materials are used. And painstaking quality control is rigidly enforced through each and every step of manufacture.

Features include quick and positive operation—just a quarter-turn to open or close. Lubricant grooves surrounding each port provide a positive seal when the valve is closed. In an open position, seating surfaces are not exposed.

Valve users who want one source of supply for lubricated plug as well as all types of bronze, iron, steel and corrosion-resistant valves will want full details on Powell Lubricated Plug Valves.

Available in Steel and Semi-Steel through distributors in principal cities. If none is located near you—or if you need help on valve problems—write direct to

PERFORMANCE PV VERIFIED

BRONZE, IRON, STEEL AND CORROSION-RESISTANT VALVES

The Wm. Powell Company, Cincinnati 22, Ohio . . . 110th YEAR

The source of supply for all valve needs!

Market Newsletter

CHEMICAL WEEK
December 1, 1956

At least one polyethylene resin producer last week decided to be realistic about quoted schedules, take official note of some under-the-counter shading that's been going on in the formulation market. Tennessee Eastman has notified its customers that it's posting a flat 10% discount on large-quantity shipments of molding and some extrusion materials. New listed truckload resin price, for example, will be 36.9¢/lb. Colored polyethylene prices, too, will come down about 4¢/lb.

The move recalls Du Pont's similar action of discounting 5% last July. And now, as they did then, other polyethylene makers are expected to follow suit.

Reason, of course, underscores the present—and anticipated—supply/demand condition; this country has, or will soon have, capacity to turn out 600-650 million lbs./year. A good estimate of consumption for this year is about 450 million lbs. Most observers are certain the lop-sided situation will right itself as polyethylene uses expand, but a balanced market may be 3-4 years away.

•

Increased copper sulfate capacity comes at a time when—as recent price cuts indicate (*CW Market Newsletter, Nov. 3*)—supplies are more than ample, due primarily to seasonal slackening of agricultural needs.

Now complete, Republic Chemical's million-dollar expansion of its facilities at Curtis Bay (Baltimore) doubles the firm's copper sulfate capacity. (Total capacity is not revealed.)

However, total U.S. copper sulfate output—by three producers—is approximately 120 million lbs./year, represents sales in excess of $20 million; total world consumption is about 1 billion lbs./year.

•

And readying for thorium production is the Chattanooga plant of Heavy Minerals Co. (owned 40% by Crane, 20% by Pechiney of France). It's time-tabled for completion by Dec. 15, will go onstream Jan. 1.

Initial output will include thorium oxide for the nation's atomic energy program, oxides for polishing lenses, fluorides for carbon arcs, and various chlorides—raw materials for the production of rare earth products (*CW, April 28, p. 90*).

•

This week, a major chlorine customer is about ready to step around to the other side of the counter. Weyerhauser Timbers' spanking new 100-tons/day plant at Longview, Wash. (*CW, Jan. 7, p. 73*) is on a shakedown run. Full-scale production is scheduled for Jan. 1, the day the company's contracts with suppliers expire.

Weyerhauser's output will be captive, but its withdrawal as a chlorine buyer won't adversely affect the market. Fact is, chlorine supply at the moment is generally rather tight (even with producers working at top capacity rates), so the "released" material will contribute somewhat to easing the over-all pinch. The modest $2/ton increase, which went into effect at the beginning of the current quarter, wasn't much of a sales deterrent.

Speaking of prices and quarters, Jan. 1, '57, may not bring on as many upward revisions as did Oct. 1, but it will definitely jack the price index higher. Most major maleic anhydride sellers, for instance, will follow Monsanto's move of late last week, advance schedules 1½¢/lb. across the board. It's the first maleic increase in six years (there were two reductions in '53), and is being posted despite today's less-than-bustling demand. Reason: cumulative increases in manufacturing costs (raw materials, labor, freight).

New delivered prices to Eastern points effective immediately on spot orders, Jan. 1 to contract customers: 27½¢/lb. in tanks; 28½¢/lb., c.l.; 29½¢/lb., l.c.l. Users west of the Rockies will pay an additional 1½¢/lb.

Expectations that dyestuff prices would go up (*CW Market Newsletter, Nov. 17*) are being realized. American Cyanamid last week announced that increases of 18% on most of its dyes would become effective the first of the year, and for the now-familiar reason—selling price advances have been "nominal," have not kept pace with rapidly increasing costs of making and delivering dyestuffs to customers.

These same factors, of course, will prod just about all dye color producers into making similar revisions of price lists.

•

U. S. production of ethyl alcohol is keeping a step ahead of current consumption levels; thus, observers say, the French government's ban on exports (to aid its own expanding need) will have little effect on the market here.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending November 26, 1956

UP

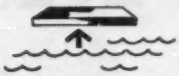
	Change	New Price
Casein, imp., acid-precip., grd., Arg., bgs., c.l., duty paid, lb.	$ 0.015	$ 0.25
Maleic anhydride, spot, tanks, dlvd. E., lb.	0.015	0.275
Molasses, blackstrap, feed grade, tanks, N. Y., gal.	0.02	0.27
Tin metal (Straits), lb.	0.0225	1.1225
Stannic chloride, anhyd., dms., works, lb.	0.009	0.846
Stannous chloride, anhyd., dms., works, lb.	0.012	0.988
Carnauba wax, yellow No. 1, Ceara, bgs., ton lots, lb.	0.01	1.43

WHAT DO YOU HAVE IN MIND FOR RED OILS?

CLEAN HANDS—NO WATER?

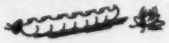
As an emulsifier and jelling agent, soaps from Swift's Red Oil serve many grades of waterless hand cleaners. Good odor, color, and uniformity are essential and expected, here.

"FLOAT" SOME IRON?



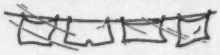
An efficient collector for separation in iron ore flotation processes, Swift's Red Oil is low in titer, high in uniformity, high in selective ability.

KILL SOME PESTS?



Swift's Red Oils help make a low titer, uniform, high purity emulsifier for liquids; help suspend solids and lower surface tension, to cover greater areas—more uniformly.

WASH SOME CLOTHES?



Light color, excellent stability and bland odor help Swift's Red Oil help you to make excellent soaps for textile scouring or for use in textile chemicals.

MAKE A MIX?

For use in emulsifiers for the lightest colored wax or the purest grade of cosmetic product, Swift's Red Oil is of dependable quality, good color and uniform from batch to batch.

WAX JOB?

Swift's Red Oils meet exacting standards as an emulsifier for high grade wax products where bland odor, uniformity, light color and high coverage are important.

■ The job which you have in mind, or in *work*, for Red Oil may bear but a family resemblance to those noted above—such is the point we wish to make.

Collectively, Red Oils are a "workhorse" product but specifically, they must do *your* job. That's why Swift & Company uses SOLEXOL—a unique manufacturing process which works at a temperature far below that of vacuum distillation. It gives Swift's Red Oils the advantage of really effective, *selective* decolorization, and positive, controlled removal of impurities. With Solexol, we are able to produce Red Oil #805 and #810—products which will meet many of the color and stability requirements laid down for premium priced, double distilled Red Oils.

Whatever *you* have in mind for Red Oil, you can be confident in specifying Swift's—in a grade tailored to your needs. Write for details on a trial order and remember . . .

ONE TRIAL IS BETTER THAN A THOUSAND CLAIMS

Oleic Acid (Red Oil) • Animal Fatty Acids • Textile Processing Oils • Stearic Acids • Hydrogenated Fatty Acids • Larex (Swift's Lard Oils) • Neatex (Swift's Neat's-foot Oils) • Spermaceti U.S.P. • Hydrogenated Glycerides • Sperm Oils • Glycerine • Anti-Foam Agents • Monoglycerides • Sulfonated Oils • Palmex (for Steel Mills) • Tallows • Vegetable Fatty Acids

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Company _____

Address _____

City _____ *Zone* _____ *State* _____

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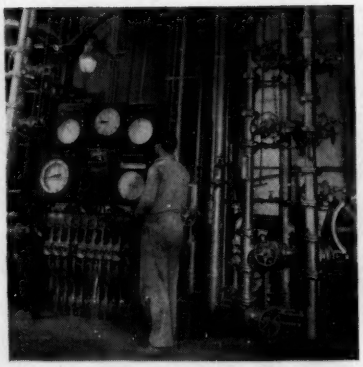
2 **PAINT** — The full line of RCI surface coating resins includes *Wallkyd* pure drying alkyds and *Wallpol* polyvinyl acetate emulsions for superior interior finishes that are easy to formulate . . . and easy to apply.

3 **PLYWOOD** — The wood products industry gets fast delivery from RCI on a wide range of adhesives . . . everything from *Plyophen* phenolic to *Plyacien* protein glues.

4 **PLASTICS** — Countless products — like sport car bodies, luggage, fishing rods — gain production and sales advantages when made of reinforced RCI *Polylite* polyester resins or *Plyophen* phenolic resins.

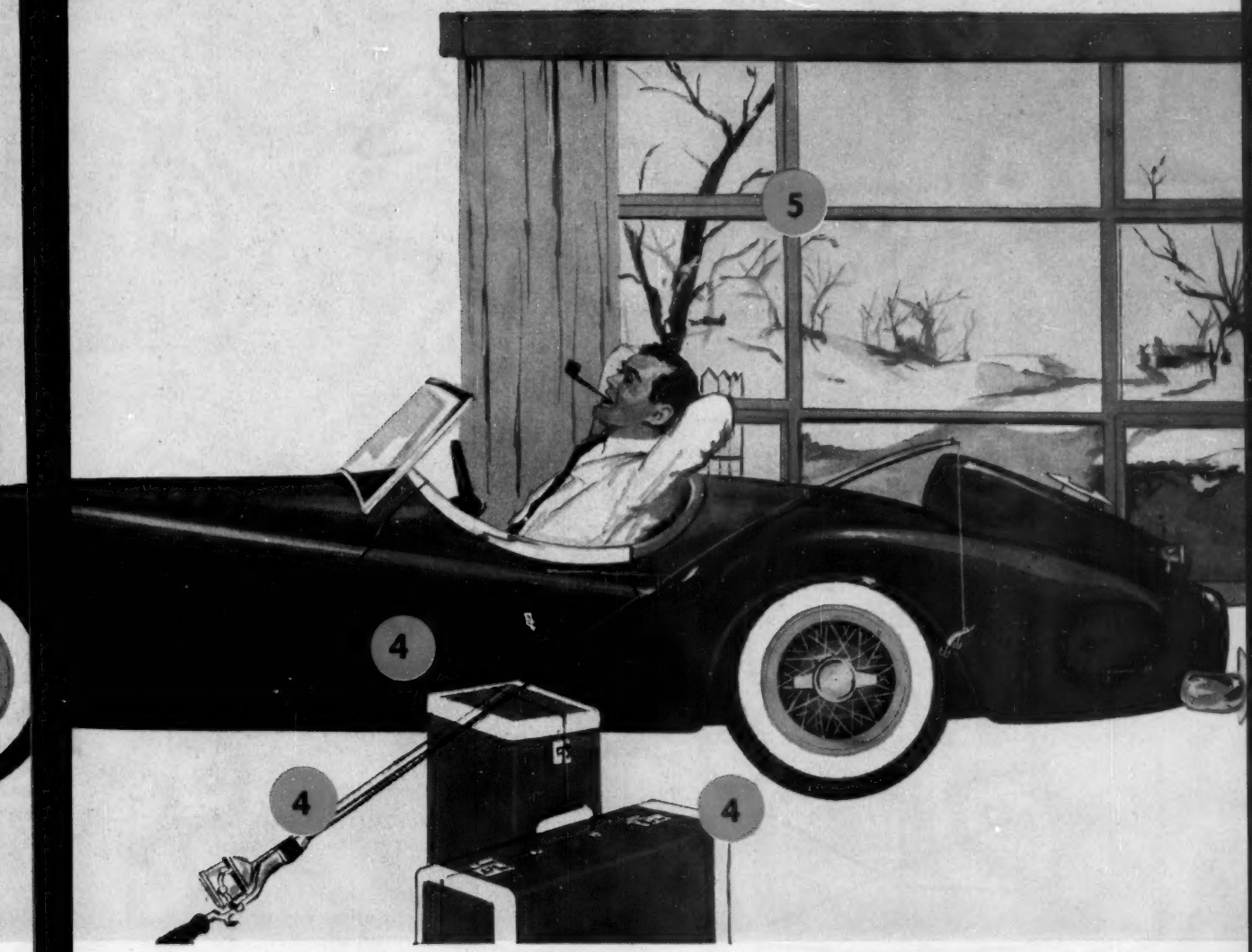
5 **LUMBER**—RCI pentachlorophenol is an important ingredient of easily-applied preservatives for wood. It helps make wood exposed to weather last for many years.



AT RCI — Operator checks instrument panel of phenolic resin kettle in our Seattle plant. Reichhold phenolic resin adhesives are carefully formulated to give a waterproof bond in "hot pressed" fir plywood panels.

Everywhere you look — Fir plywood bonded with phenolic resin adhesives adds extra rigidity at low cost in new home sheathing. Plywood manufacturers count on RCI for technical help in developing superior glues.

. . . RCI is in the Picture!



• *Paper, paint, plastic and wood products.* Somewhere in *your* production, too, RCI fits right into the picture. Or should soon! We think so because RCI offers a list of top quality resins and basic chemicals. A list that's growing all the time. These materials are made in plants all over the country for fast delivery by truck or rail.

Take just one example . . . phenol. As a leading supplier of phenolic resins, we've used a lot of phenol for years.

Today we make it ourselves. And sell it, too. As a customer for our phenol you benefit from both fast service and the careful control we exercise in manufacturing this versatile chemical. We *have* to be careful . . . to protect the uniformity of *our own* resins.

Next time you have a supply problem (or a technical problem), take a look at RCI. See where our production can fit into your picture with fast delivery on any of the quality-controlled materials listed below.

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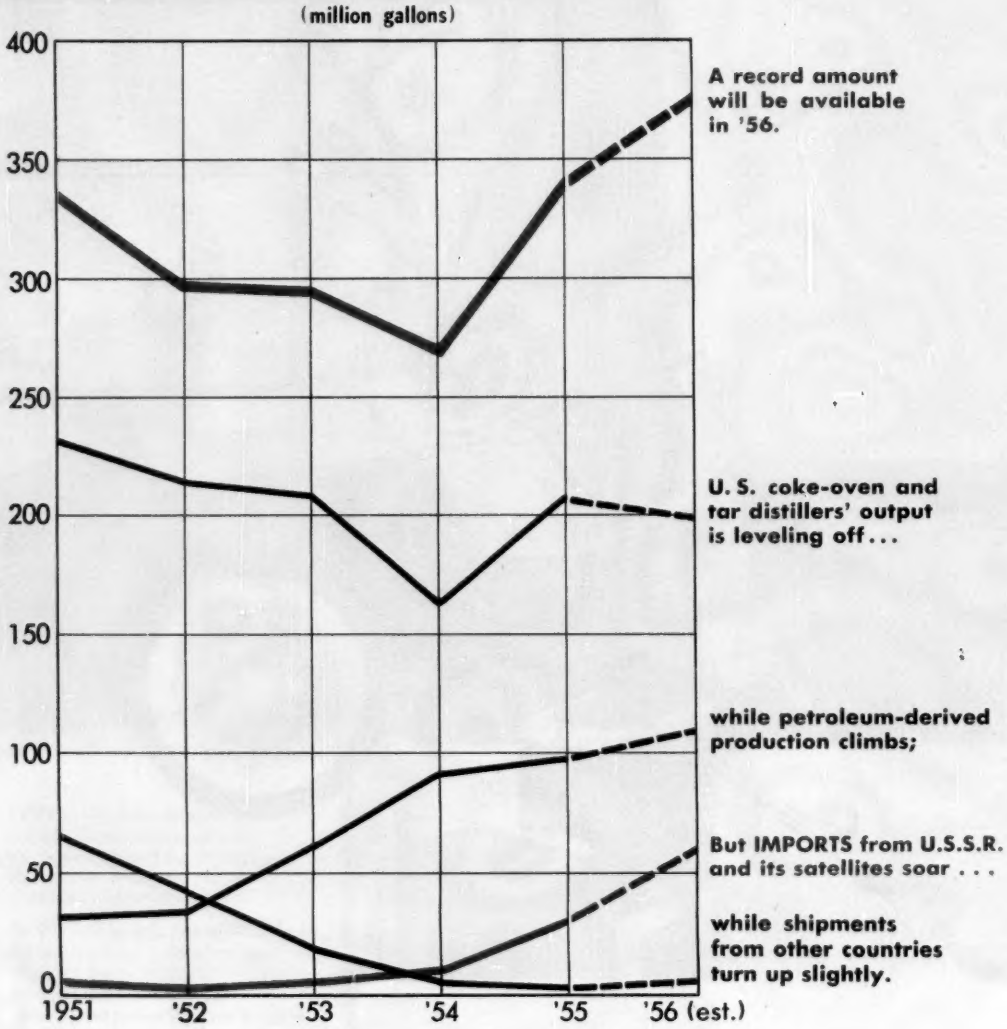
BENZOL AVAILABILITY



Hot Spots Brewing for Benzol

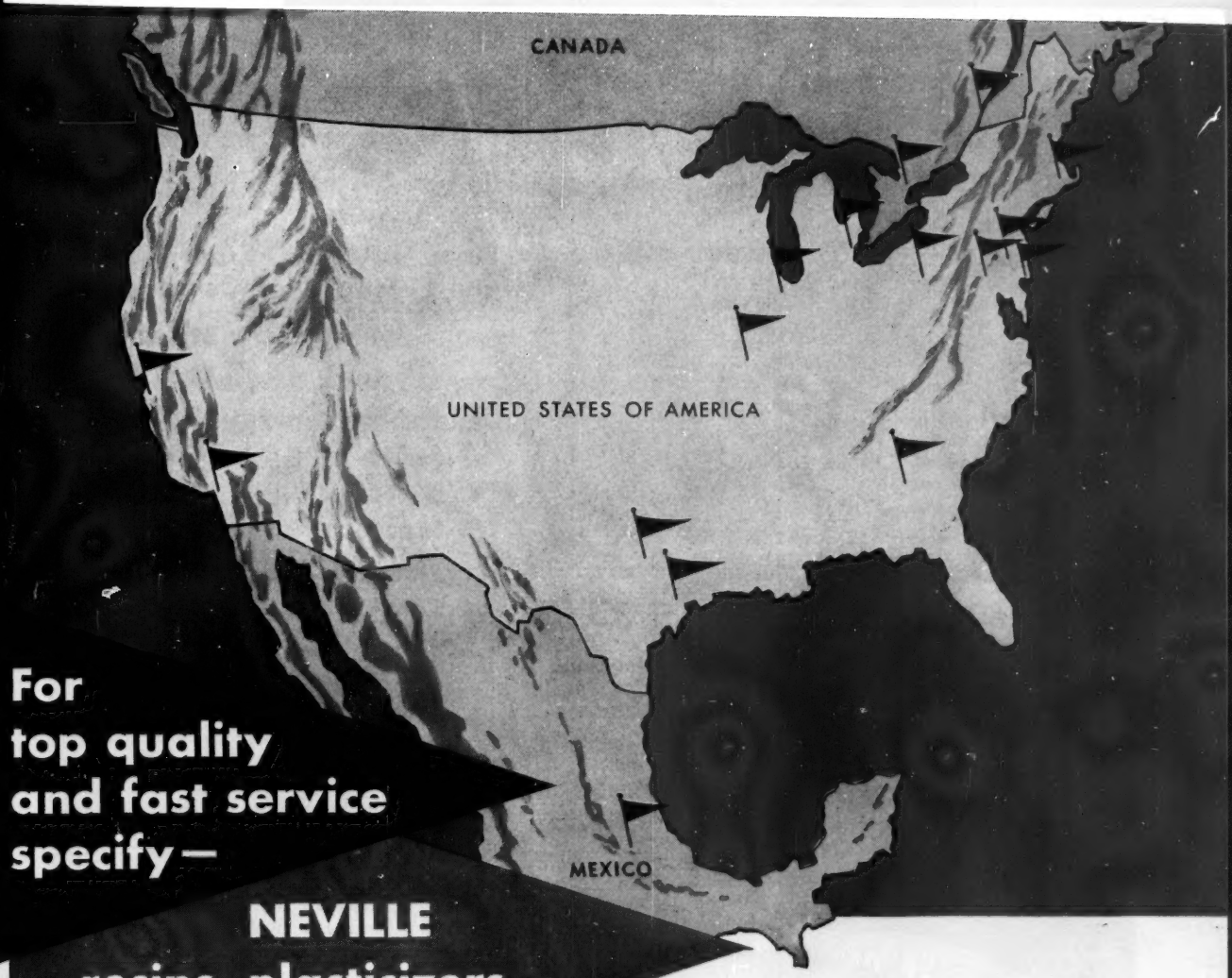
Despite the strife and unrest within the Iron Curtain orbit and in the Middle East, U.S. benzol imports from Russia and its satellite countries this year will hit some 58 million gal.

This, plus an additional 6-7 million gal. from other areas of the world, including Canada, West Germany and the Netherlands, will push total imports to within hailing distance of the record 68.5 million gal. shipped in during the peak Korean War year, '51.

As the table (*p. 102*) shows, as recently as five years ago, only 657,000 gal. of benzol were exported to this country from the U.S.S.R., while more than 100 times that amount came from other countries. Today, only about a tenth of total imports come from non-Soviet sources.

More startling than the quantity of foreign benzol imports, however, is the fact that the U.S. is consuming—and needs—just about every gallon, even with this year's anticipated production of nearly 200 million gal. by steel industry coke ovens and tar distillers, and 110 million gal. from petroleum sources. It's one of the few instances where foreign influx of a chemical is not generating much resentment among producers in this country.

Heavy demand from the roster of outlets *(see p. 104)* is—and will likely continue—absorbing the record amount of benzol coming into the market from coal, petroleum and



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Benzol Imports

(thousand gallons)

Year	From U.S.S.R. and Satellites	From Other Countries
1951	657	67,883
1952	0	43,743
1953	1,029	19,565
1954	6,975	5,522
1955	28,645	3,435
1956 (est.)	58,000	6,000

overseas producers, at least for the foreseeable future.

Petro Pep-Up: There's no telling, of course, how seriously the current international unrest will change the U.S. benzol source picture. But though imports may peter out—and some feel certain this will happen during '57—new petroleum aromatics facilities being constructed, or in planning stages, may up U.S. petrobenzene capacity some 60-70 million gal./year within the next two years.

To date, only Humble Oil & Refining and Ashland Oil & Refining have officially announced expansion plans. Construction of the former's new benzene plant at its Baytown, Tex., refinery will begin within a few weeks. The unit is designed to turn out about 24 million gal./year of high-purity benzene, and production is slated for completion near the end of '57.

At about the same time, Ashland's 21-million-gal./year aromatic chemicals addition to its refinery at Buffalo, N.Y., will also be completed.

Several other petroleum producers will soon reveal aromatics expansion plans. These may include:

- Delhi-Taylor (Corpus Christi, Tex.), which already has a Udex unit under construction and will be ready to turn out aromatics at a 30-million-gal./year rate by mid-'57. Volume will vary, but the benzene plant-to-be is being described as "one of the largest of its kind in the world."
- Suntide (also at Corpus Christi), which is now breaking ground for a Rexformer unit and expects producing facilities to go onstream June 1, '57. Capacity will be about 40 million gal. of aromatics. Probable breakdown: more than 6 million gal./year of nitration-grade benzene; about 12 million gal./year of nitration-grade toluene; better than 22 million gal. of 10-degree xylene.

In addition, Sinclair has under way at Harvey, Ill., a research project on benzene. Although no allocation for a plant has yet been made Richfield (Los Angeles) is said to be mulling over benzene expansion plans. (Pure Oil, at Smith's Bluff, Tex, will put in an Ultraformer unit in a few weeks, but the product will be motor fuel, not benzene, as some trade talk has it.)

Add too, the likelihood of more benzene imports from additional capacity in Canada, and it becomes clear that overseas material will lose some importance as a balance weight on the U.S. supply/demand scale. That eventually, however, is some months away. Most trade followers will concede that a sudden cutoff of such supplies now would generate a market squeeze on benzol consumers.

And price would be the first pinch. Foreign tags would be boosted here if European users bid for the material for stockpiling purposes and to funnel to motor fuel (because of a probable petroleum shortage), or, at the least, to compensate for higher shipping costs. Import prices, reportedly, have been as low as 19¢/gal. (for benzol that must be processed further); 27¢/gal. for good chemical grade. But, as one

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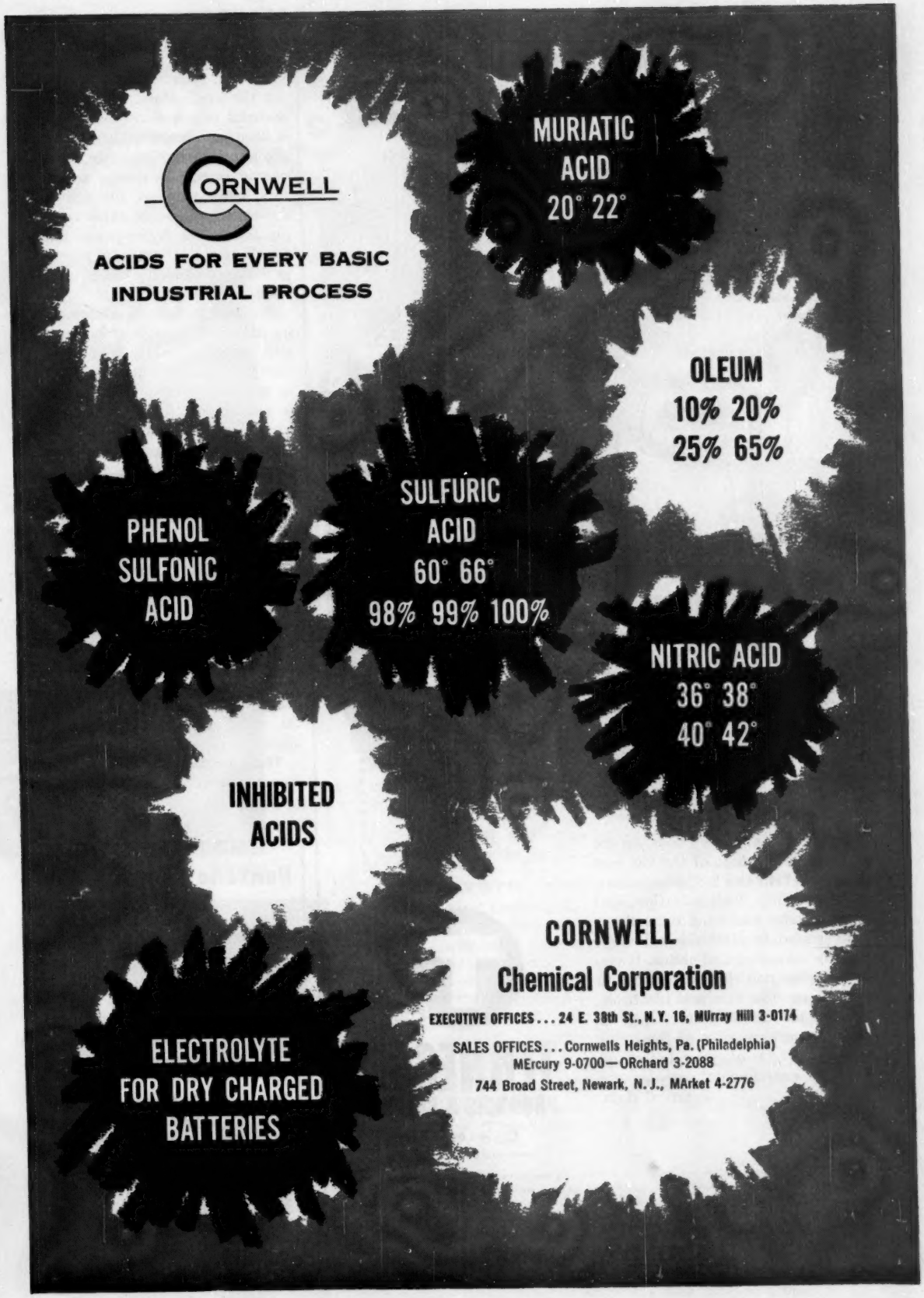
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major importer and user is quick to point out, such reported prices don't tell the whole story. The lower-price material is not pure, must be acid-washed and distilled. Then, too, there are transit losses, insurance, increased charter rates, plus storage and inventory costs required for full cargo movements. Some of these costs apply also to the higher-priced imports which, says the buyer, are pure "only in the sense that they can be used for some noncritical processes."

But even with these added charges, it's admitted that imported material sells here for less than the present 36¢/gal. domestic price that has been in effect since early '55. The spread is one reason why domestic prices have been so remarkably steady. Current events may soon bring about a change for the higher, but the increase is expected to be a small one. Why? Present selling price is probably realistic enough not to discourage building of additional petro-benzene capacity to meet expanding benzene requirements, yet is not high enough to encourage a market flood that could come from existing and planned reforming capacity. Too, a higher U.S. market price would divert a great deal more benzol from European outlets, contribute to an availability here of far more than the market could absorb.

Thus, market followers reason, if domestic schedules are advanced, the

Benzene Consumption 1957

This much ▼ million gallons	May go here ▼
145	Styrene
75	Phenol
16	Aniline
30	Nylon
24	Synthetic detergents
14	DDT
10	Maleic anhydride
4	BHC
4.5	Diphenyls
34	Others*
356	Total

* Includes mono- and dichlorobenzene, nitrobenzene, decylbenzenes, solvents, etc.

Typical HARSHAW CATALYSTS

and How they are Used

TABLETED

EXTRUDED

SPHERICAL

GRANULAR

POWDERED

DEHYDROGENATION CATALYSTS

CHROME-ALUMINA—available in powder or tablet form containing various percentages of chromium oxide supported on high surface area alumina—can be supplied as promoted catalyst and is also available as screened granules.

IRON—tableted iron oxide.

REFORMING CATALYSTS

MOLYBDENA-ALUMINA—supported molybdenum oxide on alumina—available as microspheres for fluid techniques, or as tablets for fixed bed application.

COBALT MOLYBDATE—a supported cobalt oxide—molybdenum oxide catalyst supplied in tablet form.

NICKEL-ALUMINA—a spherical catalyst available as hard spheres measuring ¼″ to 1″ diameter—used for some types of gas reforming.

DESULFURIZATION CATALYSTS

COBALT MOLYBDATE—a supported cobalt oxide—molybdenum oxide catalyst supplied in tablet form.

ZINC OXIDE—a pelleted zinc catalyst used in the desulfurization of natural gas.

MOLYBDENUM SULFIDE—powdered and tableted molybdenum sulphide.

CHLORINATION CATALYST

COPPER—supported copper catalyst prepared and shipped as tablets or granules.

HYDROGENATION CATALYSTS

NICKEL-KIESELGUHR—supplied as unreduced, or reduced and stabilized, tablets, ⅛″ to ⅝″ diameter.

NICKEL-ALUMINA—available in tablet form containing nickel as nickel oxide on high surface area alumina, or in spherical form supported on low area, high-fired alumina.

RUFERT FLAKES—reduced nickel protected by hardened oil shipped as free-flowing flakes for hydrogenation of all glyceride and acid fats.

COPPER-CHROMIUM OXIDE—shipped as powder or tablets, stabilized or non-stabilized, with varying ratios of copper oxide to chromium oxide.

NICKEL-ALUMINUM—powdered 50:50 alloy used for preparation of active nickel catalyst for low temperature hydrogenation.

CATALYSTS FOR ORGANIC SYNTHESES

ZINC CHROME—a tableted zinc oxide—chromium oxide catalyst used in the synthesis of methanol.

MERCURIC CHLORIDE—a granular catalyst consisting of mercuric chloride on active, granular carbon used in the synthesis of vinyl chloride monomer.

COBALT THORIA—available as powder or tablets, a thoria promoted cobalt catalyst employed in Fischer-Tropsch synthesis.

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Whether your requirement is measured in tons or pounds Harshaw can produce your catalyst exactly to your specifications of raw materials, chemical composition, and physical properties such as length, diameter, crushing strength, abrasion resistance, and bulk density. AND, make delivery when you want it. Call on Harshaw today—for further information or technical assistance.

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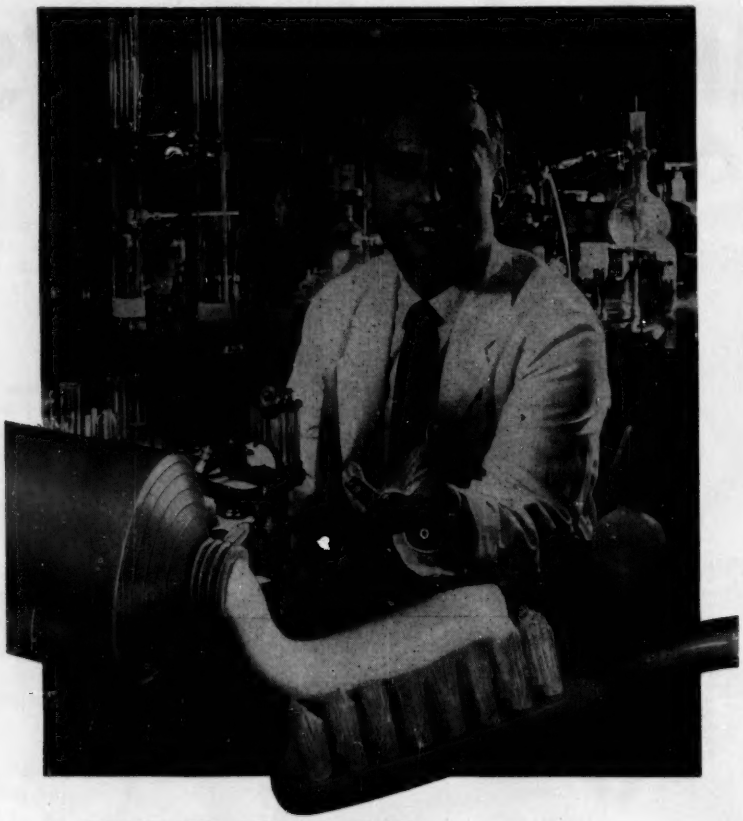

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increase would be a modest 1½¢ or, at most, 2¢/gal. But consumers—fully aware of the disrupting market factors brewing, and with demand for their benzol-using products rolling along satisfactorily—aren't expected to cut their orders in protest to the slightly higher price.

As indicated, U.S. outlets are consuming benzol at a record pace and the rate of usage is trending upward. Next year, for example, styrene, the biggest benzene user, will take about 145 million gal., at least 10 million more than the estimated '56 use; phenol may take 5 million gal. more to up its benzene use to 75 million; and nylon may increase its benzene consumption to some 30 million gal.

Demand for styrene monomer is at its high for the year because of reviving automotive production. Tire, foam rubber and other users have synthetic rubber makers gearing to near-capacity levels, and any slicing of natural rubber imports would serve as an added stimulus. With the low 12¢/lb. monomer price (compared with today's 16¢) scheduled to go into effect on multimillion-pound contracts (*CW Market Newsletter, June 23*), benzene consumption in this category should tally even higher than estimated. (There's talk, incidentally, that styrene monomer sellers not prepared to offer big-tonnage contracts will also post the 12¢ price.)

Both the short-and long-term outlooks for phenol are fair, presaging a steady 8-10%/year increase in benzene requirements. Underlining phenol's future is Monsanto's just-announced plan to expand facilities (at Monsanto, Ill.) approximately 25%. Increased output is due in the second half of '58.

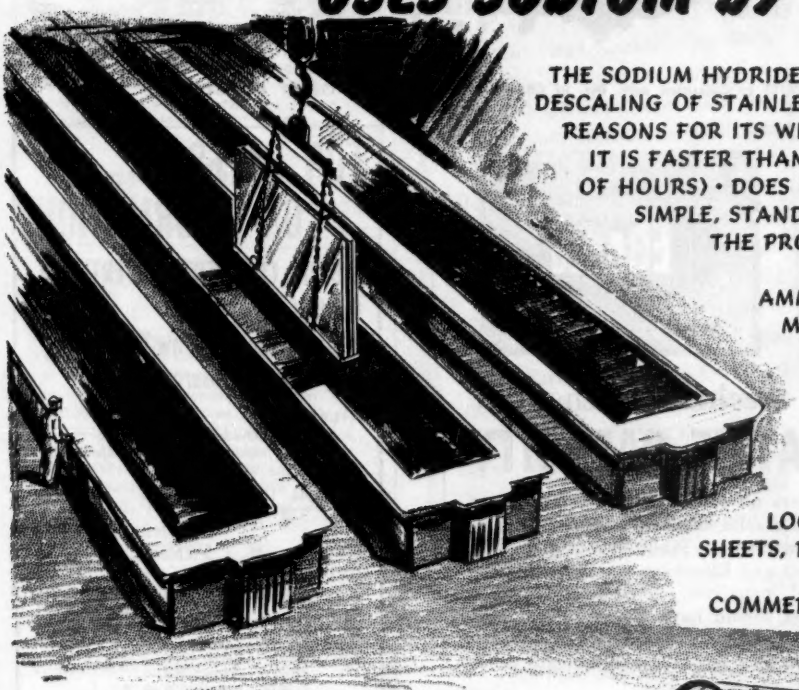
DDT production may fall off next year, and concomitantly decrease the need for benzene, but aniline (because of an expected acceleration in synthetic rubber production) and maleic anhydride may pick up enough to offset the loss.

Detergent markets, too, may take at least 5-10% more benzene in '57.

As far as demand is concerned, benzol producers and sellers have few immediate worries. The big problem now confronting consumers is whether new petro-benzene facilities will be ready should foreign sources of supplies dry up. The answer may come soon.

keeping up with **SODIUM**

METAL DESCALING USES SODIUM BY THE TON



THE SODIUM HYDRIDE PROCESS HAS STREAMLINED DESCALING OF STAINLESS STEEL AND OTHER METALS. REASONS FOR ITS WIDE AND RAPID ACCEPTANCE: IT IS FASTER THAN PICKLING (MINUTES INSTEAD OF HOURS) • DOES NOT BITE THE METAL • USES SIMPLE, STANDARD EQUIPMENT.

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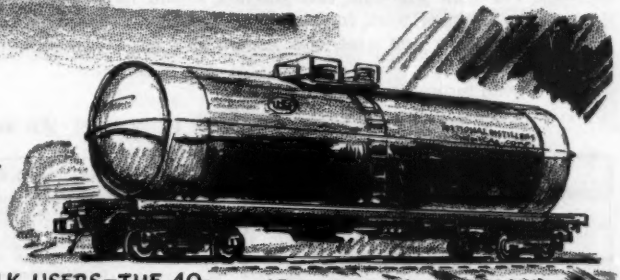

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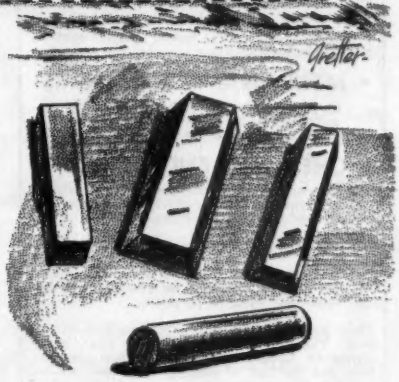

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EBASCO
BUSINESS CONSULTANTS

to the chemical or mechanical engineer with ADMINISTRATIVE CAPACITY

Ebasco Services Incorporated offers an excellent opportunity for a Chem. or Mech. Engr. 40-50, with a solid chemical background. Experience should encompass Drafting, Design, Plant Layout and Field Engineering, extend to Managerial and Executive work in administration and sales in the chemical industries.

The man who fills this position should have Ch. E., have done post graduate work in Business Administration, possess good judgment, drive and executive capacities. Salary commensurate with experience.

Send resume in full confidence to:

MR. W. W. PATTERSON, EBASCO BUILDING, 2 RECTOR STREET, NEW YORK, N. Y.

CHEMISTS AND ENGINEERS

2-5 years experience for technical assignments in several challenging fields.

- **MECHANICAL ENGINEERS:** Change and design of synthetic fiber equipment, development and extrusion of plastic products, or in maintenance and repair fields.
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- **CHEMISTS:** All degrees, preferably MS and PhD, organic and physical chemists for research and development work in polymers.

These permanent positions offer excellent future with Virginia's newest synthetic fiber plant (nylon-6). Complete benefit plans, new opportunity, and the best of working conditions will be found in this project.

Send resume to:
NATIONAL ANILINE DIVISION
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Hopewell, Virginia

RESEARCH DIRECTOR

Medium sized chemical company is seeking a chemist with sufficient experience to head up and direct its research and development program. Excellent opportunity and future for the right party. Experience in detergent formulations helpful. Write giving detailed resume and salary expectations to

P-3551—Chemical Week
Class. Adv. Div., P.O. Box 12, New York 36, N.Y.

ENGINEER

Chemical engineer needed to head up and direct the maintenance and expansion programs of medium sized chemical company employing three hundred people. Excellent opportunity for future awaits the correct man. Write giving full details of past experience and salary expectations to

P-3552—Chemical Week
Class. Adv. Div., PO Box 12, New York 36, N.Y.

Positions Wanted

Patent Attorney—Ten years experience all phases of chemical patent work. Desires challenging position. Chicago area preferred. PW-3529. Chemical Week.

Chemical Sales Manager, experienced in sales planning, marketing, supervising industrial sales. Age 42. Background in sales, development, graduate chemical training. Offers knowledge of both your markets: chemical and process industries. Seeks position demanding both sales management capability and sound technical judgement. PW-3445, Chemical Week.

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the box number when answering advertisements. It is the only way we can identify the advertiser to whom you are writing.

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HUbbard 2-7160
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SPECIALTIES OR WAX EMULSIONS

We require a man experienced in the development of waxes, polishes, or other chemical specialties. Must be able to test against specifications. Age under 40 preferred, but "know how", initiative, and determination to grasp opportunities is the prime requisite.

We suggest you investigate this opportunity afforded by one of the most modern and up to date laboratories of its kind. Congenial environment, company paid for retirement program, and a liberal salary arrangement to the right man, make this a very worthwhile proposition.

Please phone Mr. C. W. McDermott,
Trinity 7-6200

Franklin Research
5134 Lancaster Ave., Phila. 31, Pa.

Space Salesmen
Wanted

We are looking for sales trainees to sell advertising space for CHEMICAL ENGINEERING or CHEMICAL WEEK. No selling experience necessary. Age requirement 21-30 years. Opportunities unlimited. Send complete résumé or phone for appointment. Contact Steven J. Shaw, Advertising Sales Manager, CHEMICAL ENGINEERING • CHEMICAL WEEK, McGraw-Hill Publishing Co., 330 W. 42nd St., New York 36, N. Y. Phone: LOngacre 4-3000. Ext. 693.

TILING ENGINEER
WANTED
Vinyl Asbestos or Vinyl

Excellent opportunity for man having several years experience. Liberal benefit programs. Location, Penna. Replies confidential. Reply

P-3168, CHEMICAL WEEK
Class. Adv. Div., P. O. Box 12, New York 36, N. Y.

FLOOR TILE CHEMIST
Wanted

Experienced manufacture vinyl tile. Liberal benefit programs. Replies confidential. Reply

P-3167, CHEMICAL WEEK
Class. Adv. Div., P. O. Box 12, New York 36, N. Y.

OPPORTUNITIES

ARTHUR J. HUGHES specializes in the placement and procurement of CHEMISTS, ENGINEERS, METALLURGISTS, PHYSICISTS AND SALESMEN of the highest caliber.

To the EMPLOYEE—WE OFFER a confidential service, getting you the position where your education and experiences can be most useful.

To the EMPLOYER—WE SUBMIT for your approval only the applicants best suited for your personal needs.

Mail resumes to: Arthur J. Hughes
Wabash Agency 202 S. State Chicago 4, Ill.

SALES OPPORTUNITIES

If you are a manufacturer seeking new or added sales outlets—or if you are a manufacturer's agent or chemicals distributor with the capacity, time and energy to take on additional lines—make your interests known in this column of CHEMICAL WEEK. The right agent or jobber teamed up with the saleswise manufacturer makes the right combination for the hard selling days ahead. There's profit for both, which can be initiated through low-cost classified advertising. Write EMPLOYMENT OPPORTUNITIES, Chemical Week, P. O. Box 12, N.Y. 36, N.Y.

Sets Up New Development Department—

Top Scientists With 0 to 5 Years' Experience Needed by Largest Producer of Synthetic Organic Chemicals

Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation, recently announced the reorganization and expansion of its Development Department. It will use the tools of applied research, chemical engineering research, and pilot plant operations to determine the most economical and technically feasible method for producing a chemical product with the highest quality at the lowest cost. It will also be responsible for finding end uses for new products, and for developing new products to meet specific needs. Operations research techniques will be employed frequently to examine, direct, or evaluate these experimental programs.

Extensive new facilities, to be completed in 1958, are under construction in South Charleston, West Virginia. Expansion of the Development staff is already underway in preparation for the greatly increased activity that these new facilities will make possible. Plans for expansion offer chances for rapid advancement in the Development Department.

Men are needed who can initiate experimental work in the fields of both resins and chemicals, and assume complete responsibility for the prosecution of the experimental programs and for the promoting of development work to follow the experimental studies.

Scientists interested in the following fields will find opportunity and encouragement:

FIELD	REQUIRED BACKGROUND IN:
Chemical Engineering	Operation of pilot plant equipment to provide data for engineering design.
	Process development—design and construction of new chemical engineering equipment.
Organic Chemistry	Organic chemistry, theoretical and practical—synthetic production of aliphatic, aromatic, and metallo-organic chemicals; resins and plastics.
Physical Chemistry	Revelation of polymer structure by physical chemical instrumentation methods—activation of evaluation programs for resinous materials.
	Fundamental approach to problems involving catalysis—experimental actuation of the catalysis involved in such problems.
	Measurement of properties, reaction rates, ionization constants of organic compounds. Design of measurement equipment.
Organic Analysis	Functional group analysis organic chemistry—non-aqueous titrimetry—trace analysis.
Engineering Physics	Physical chemical measurement—methods of testing resins and resin solutions—rheological and other properties of high polymers.
Mathematics	Advanced mathematics and statistical principles—numerical analysis, operations research—statistical analysis of experimental data.

Send a full description of your training and experience to E. J. Mills, Jr.

Development Department
CARBIDE AND CARBON CHEMICALS COMPANY
A Division of Union Carbide and Carbon Corporation
South Charleston, West Virginia

TRACERS TO THE CHEMICAL PROCESSING INDUSTRIES

- USED/SURPLUS EQUIPMENT
- CHEMICALS WANTED/OFFERED
- SPECIAL SERVICES
- BUSINESS OPPORTUNITIES

- **Displayed Rate**—$19.50 per inch effective Jan. 1957. Contract rates on request. Advertising inch measures ⅞ inch vertically on one column, 3 columns to a page. Not subject to Agency Commission.
- **Box Numbers** count as one additional line in undisplayed ads.
- **Undisplayed Rate**—$1.80 a line; minimum, 3 lines. To figure advance payment, count 5 average words as a line. 10% discount if full payment is made in advance for 4 consecutive insertions.
- **Closing Date**—Each Tuesday, 11 days prior to publication date.

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Chemicals—By-Products—Plasticizers
Pigments—Resins—Solvents

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CHEMICALS—OILS—SOLVENTS
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PLASTICS—COLOR—ETC.

BARCLAY CHEMICAL COMPANY, INC.
75 Varick Street New York 13, N. Y.
WORTH 4-5120

SURPLUS WANTED

CHEMICALS, PHARMACEUTICALS, OILS
PLASTICIZERS, RESINS, DYES
SOLVENTS, PIGMENTS, ETC.

CHEMICAL SERVICE CORPORATION
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HAnover 2-6970

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ODD LOTS—DISCONTINUED RAW MATERIALS —SPENT OR CONTAMINATED SOLVENTS RESIDUES—METAL SLUDGES— OBSOLETE PLANT INVENTORIES

Industrial By-Products Surplus Co.
DIV. OF ACETO CHEMICAL CO., INC.
40-40C Lawrence St., Flushing 54, N. Y.
INdependence 1-4100

"Well rated company interested distribution of chemicals and related products
in New York area. Replies invited from established manufacturers only. Might also consider assisting with financing sales.
BO-3603—Chemical Week." Classified Adv. Div., P.O. Box 12, New York 36, N. Y.

Plants for Rent

Paterson, N.J. One story brick, 26,000 ft. sprinklered high pressure steam, RR siding, underground storage tanks, fenced yard, unrestricted. PFR-2174, Chemical Week.

25 acres suitable heavy chemicals, lacquer, etc. Railroad, all facilities, N. Y. area. Contact owner. Box PFR-3405, Chemical Week.

Contract Work Wanted

Distillation Work Wanted. Specialists in volume processing customer's materials. Two 5,000 gal. steam stills; one 1,800 gal. still with 18"x30' Everdur packed column; two 400 gal. g.l. receivers, vacuum. Smaller s.s. stills, glass Columns, other process equipment available. RR siding, adequate storage & waste disposal. Chemical Affiliates, Inc., Sayreville, N. J., Phone New York, MUrray Hill 3-2503

For Sale

Bird 32 x 50 Solid Bowl Continous Centrifugal Filter, Type 316 stainless steel, built 1953. Fume tight construction. 60 HP TEFC motor. Perry, 1415 N. 6th St., Phila. 22, Pa.

J. H. Day Stainless Steel Sigma Blade Mixers 5, 50 & 75 gal. jacketed; 200 gal. non jacketed. Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.

Ozark-Mahoning Submerged Combustion Evaporator T316 stainless steel with burners, igniter, blower, gas pump, etc. Perry, 1415 N. 6th St., Phila. 22, Pa.

(250) 55 gal. Used Aluminum Drums, Benson 945-B Retnbl' 0.125 ga. Alloy 3-S, 2" and ¾" Head Bungs Excell. Cond. Sell all or part. Emery Industries, Carew Tower, Cincinnati 2, Ohio, Purch. Dept.

Business Opportunity

Chemical Plant: N. Y. Metropolitan area available on long term lease suitable for plastics, resins, paint, lacquer, etc. Railroad, large acreage with or without profitable accounts. BO 3403, Chemical Week.

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How to keep informed on the "with what" part of your business

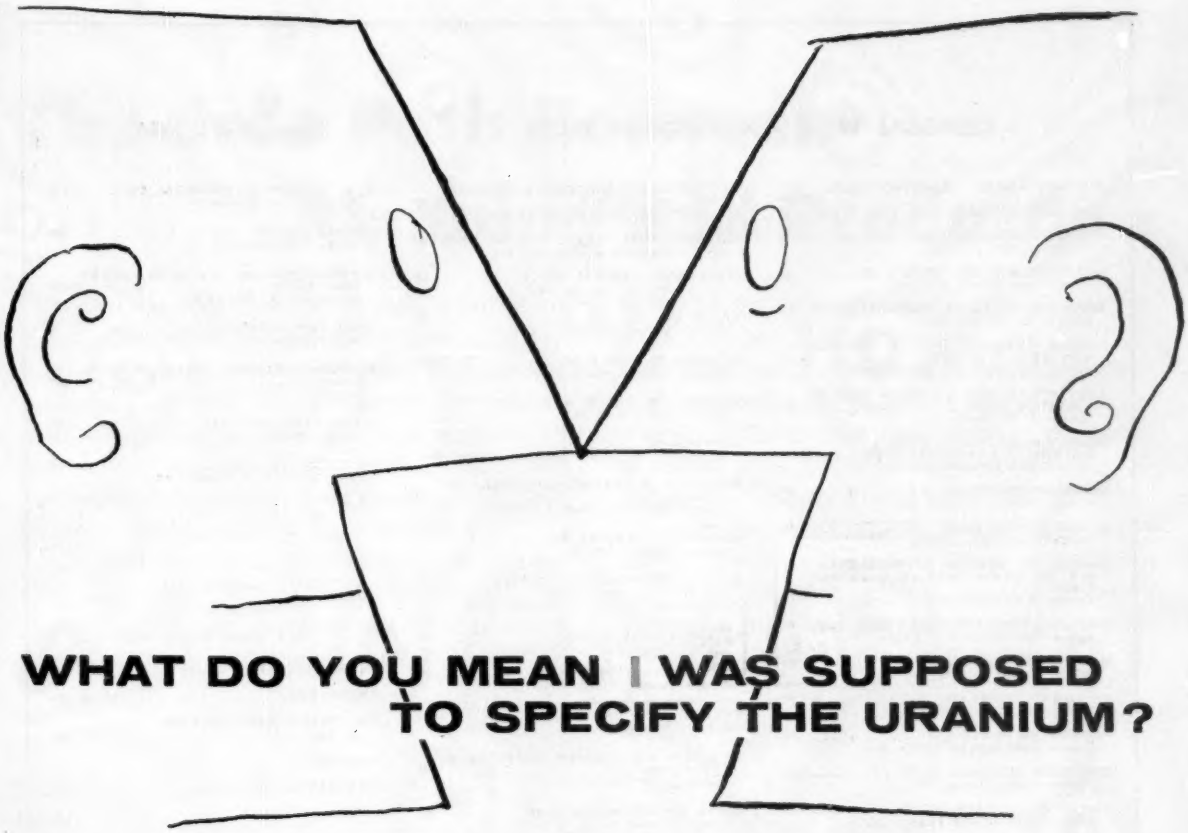
AT YOUR FINGER TIPS, issue after issue, is one of your richest veins of job information—advertising. You might call it the "with what" type—which dovetails the "how" of the editorial pages. Easy to read, talking your language, geared specifically to the betterment of your business, this is the kind of practical data which may well help you do a job quicker, better—save your company money.

Each advertiser is obviously doing his level best to give you helpful information. By showing, through the advertising pages, how his product or service can benefit *you* and *your* company, he is taking *his* most efficient way toward a sale.

Add up all the advertisers and you've got a gold mine of current, on-the-job information. Yours for the reading are a wealth of data and facts on the very latest in products, services, tools . . . product developments, materials, processes, methods.

You, too, have a big stake in the advertising pages. Read them regularly, carefully to keep job-informed on the "with what" part of your business.

McGRAW-HILL PUBLICATIONS



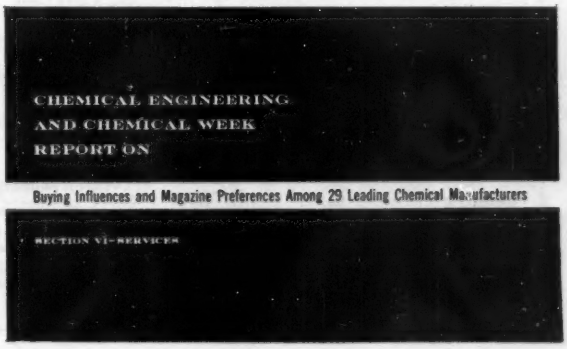
WHAT DO YOU MEAN I WAS SUPPOSED TO SPECIFY THE URANIUM?

THE CHEMICAL PROCESS INDUSTRIES *is* a sprawling giant of a market . . . but despite its size and many varied segments (chemical, drug, fertilizer, plastic, rubber, atomic, etc.) . . . all CPI operations must, and *do*, have . . . specific groups of men directly responsible for recommending, specifying and approving the chemicals, raw materials, equipment and services you have to sell.

Now, for the first time, to give the advertising and marketing executive an unbiased and accurately-defined picture of the relative importance of buying influences in the CPI . . . CHEMICAL ENGINEERING-CHEMICAL WEEK Research recently sponsored an exhaustive study actually conducted inside the plants of 29 leading industrial consumers (Monsanto, Union Carbide and Carbon, Victor Chemical, Wyandotte, etc.) under the personal direction of the advertising manager of each organization.

The result . . . a 124-page documented report, authenticated by J. K. Lasser & Co., nationally-known auditing firm. The report covers the buying influences for six major CPI product and service categories (chemicals and raw materials, processing equipment, materials of construction, operating supplies, services, etc.) . . . each in turn broken down into specific components.

To receive your personal copy of this authoritative CPI Buying Pattern study, address Director of Research, CHEMICAL ENGINEERING - CHEMICAL WEEK, on company or agency letterhead.



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(Classified Advertising)

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EQUIPMENT: Used/Surplus New For Sale 110

WANTED 110

MANAGEMENT SERVICES 110

SPECIAL SERVICES 110

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The Safe Path Between Planning and Production

The most hazardous part of the path to profits on a major investment in petrochemicals is before the plant goes on stream. Prolonged evaluation of processes and other delays in getting into production can add up to millions . . . in engineering man-hours, tied-up capital, increased labor and materials costs, procurement problems, the loss of production—and even a market itself.

Standard Oil Company of California, fully aware of these hazards, invited The M. W. Kellogg Company to participate closely in the initial planning of its new multimillion dollar ammonia plant at Richmond, California. By assigning the subsequent process design, plant engineering, and construction responsibility to Kellogg, Standard chose a path to completion that proved not only safe but fast. From the earliest discussions to the recent on-stream date, this 300 ton/day plant was producing as guaranteed in 14 months.

Further evidence of the M. W. Kellogg safe-and-sure approach to the manufacture of ammonia, butadiene, ethylene, phenol, and other petrochemicals may be obtained by contacting the company's Chemical Process Division.

Visible economies at Standard Oil Company of California's new ammonia plant include the high pressure reforming unit, which greatly reduces compressor costs; skeleton-type, economical outdoor construction; and permanent, labor-saving derrick for handling catalyst.

CHEMICAL PROCESS DIVISION

THE M. W. KELLOGG COMPANY

711 THIRD AVENUE, NEW YORK 17, N. Y.

A SUBSIDIARY OF PULLMAN INCORPORATED

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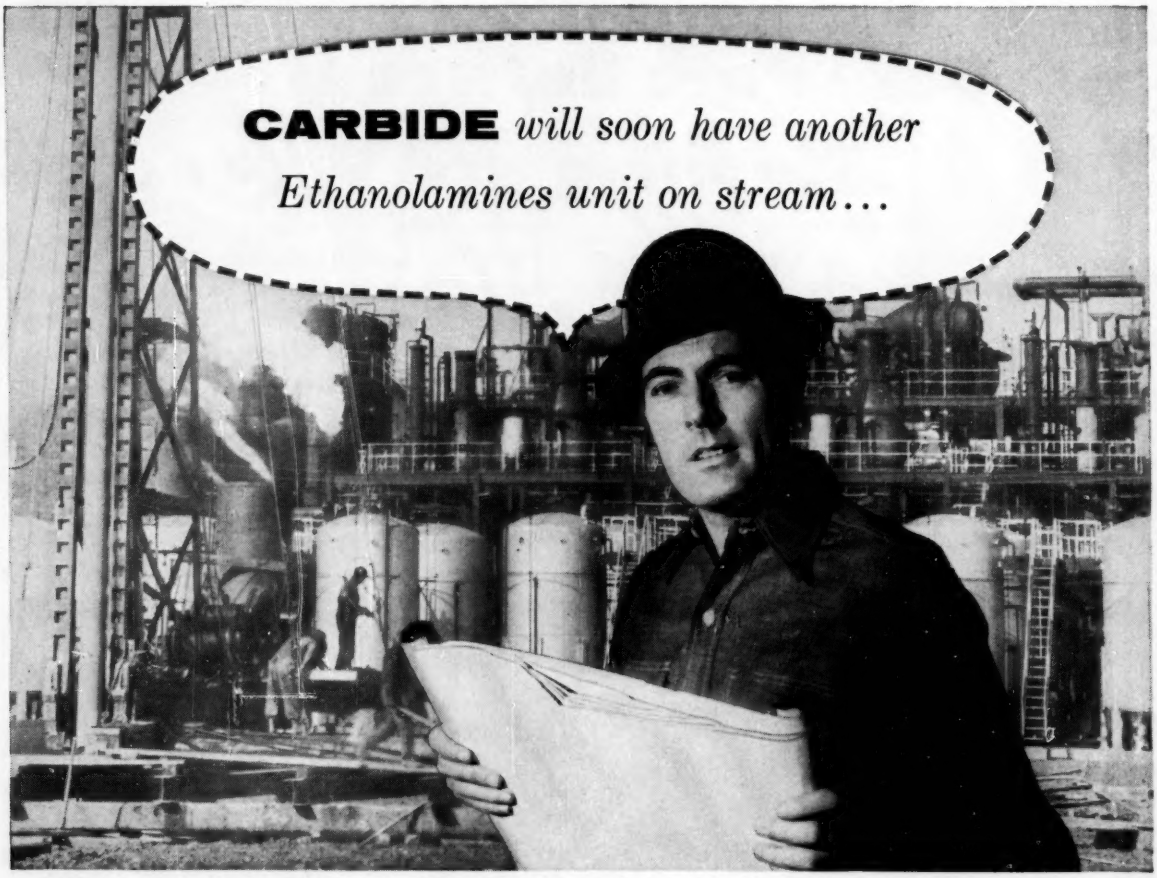

here's how you'll benefit...

CARBIDE'S Seadrift, Texas plant will soon be pouring out ethanolamines to meet growing needs for acid gas absorbents and vital components of soluble oils, detergents, and soaps. This means that there will be two plants—South Charleston, West Virginia and Seadrift—supplying you with ethanolamines.

You can share in this increased availability by checking with your CARBIDE Technical Representative now.

Here are at least three ways you can benefit by choosing CARBIDE'S ethanolamines today:

- You receive immediate delivery of mono-, di-, or triethanolamine—in the size shipment you need from the CARBIDE warehouse in your area.
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